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UNIVERSITY OF ALBERTA

AN EVALUATION OF THE INDUSTRIAL ARTS PROGRAM IN SELECTED SECONDARY SCHOOLS IN THAILAND

BY

PAISAL SRISARAKAM

A THESIS
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES AND RESEARCH
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE
OF
DOCTOR OF PHILOSOPHY

DEPARTMENT OF SECONDARY EDUCATION

EDMONTON, ALBERTA
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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research for acceptance, a thesis entitled, "An Evaluation of the Industrial Arts Program in Selected Secondary Schools in Thailand," submitted by Paisal Srisarakam in partial fulfilment of the requirements for the degree of Doctor of Philosophy.

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ABSTRACT

This study reports the results of an evaluation of the industrial arts program in 34 selected schools in the 12 educational regions in Thailand. Schools defined as small, medium and large were included in the sample.

The researcher translated Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, 1987 of the National Study of School Evaluation (NSSE) and used this instrument for data collection. In accordance with this instrument, a Self-Evaluation Committee was formed in each of the 34 sample schools. The Self-Evaluation Committee for each of these schools consisted of a principal, an industrial arts department head, industrial arts teachers, and industrial arts students. Both quantitative and qualitative data were gathered.

The quantitative data collected was organized into tables displaying participant ratings for the various criteria included in the instrument. The participants' open-ended responses were organized and presented thematically. Data analysis resulted in findings and recommendations centering on inadequate funding, the need for better school-community co-operation, the inadequacy of facilities and equipment, the need to move the existing industrial model of curriculum toward a technology model, and the need for teacher in-service.

DEDICATION

This dissertation and the degree for which it was presented
is dedicated

to

- the memory of my beloved parents, Ruangdej Srisarakam & Thongsai Srisarakam, and my late sister Thongthai Srisarakam who did not live long enough to see me finish the Ph. D. program,

- and to my loving family, my wife Niyapan and my children, Monjanok and Bhimjanok.

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CHAPTER I

THE PROBLEM

Introduction

Ever since Thailand became a constitutional monarchy in 1932, education has been perceived as essential for the progress and preservation of a democratic society and for national development. Accordingly, in 1933, the government formulated the first National Education Scheme which set directions for educational development in Thailand. Additional educational schemes were written, revised, and put into operation in 1936, 1951, 1966, and 1977. These schemes have provided and currently are providing direction to those involved in the educational enterprise.

The government of Thailand has been actively engaged in all aspects of its national development through both National Economic and Social Development Plans and National Education Schemes. The first National Economic and Social Development Plan was implemented in 1962 and extended to 1966, a period of five fiscal years. This plan incorporated the practical aspects of the concepts and innovations that were derived from National Educational Schemes. Other National Economic and Social Development Plans, which also cover a period of five years, have been implemented on a continuing basis since the issuance of the first Plan in 1962. Each Plan was aimed at developing the basic infrastructure of the country in order to provide a firm foundation for the economic growth of the nation.

While the first three Plans were devoted to the physical development of the nation, it was not until the Fourth Plan, 1977-1981, that the focus shifted from physical development to social development. The focus of the Fourth Plan expanded educational facilities and skilled manpower training for new and evolving industries into remote areas of Thailand. The Fifth National Economic and Social Development Plan, 1982-1986, was closely related to the Fourth Plan because it placed heavy emphasis not only on equity of educational opportunity for the rural population but also on the qualitative aspects of education. As well, the plan emphasized possible solutions to unemployment, which accounted for approximately 10% of the working population during that period (Office of the National Commission, 1989).

The Sixth Plan, 1987-1991, emphasizes six main issues: education for the improvement of quality of life, economy and society, life long education, educational equity, effectiveness in educational management, and mobilization and allocation of resources (Office of the National Educational Commission, 1989).

Secondary education in Thailand has always been an important facet of national development since education helps to contribute to the quality of life and helps to develop manpower to assist in meeting economic-occupational demands. There are two parts to secondary education in Thailand: lower secondary level and upper secondary level. Each level covers a period of three years of schooling. At the lower secondary level, which includes Grades 7, 8, and 9, students explore individual interests and develop their aptitudes through a wide choice of both academic and vocational subjects. Students at the upper secondary level, which includes Grades 10, 11, and 12, engage in specialized studies that lead to either further education or the world of work. When the Sixth National Economic and Social Development Plan was put into place in 1987, lower secondary education was expanded and distributed to the less developed regions of the country. In addition, equal standards and equity of schools as well as vocational studies were also given attention under this Plan.

The Problem

In Thailand, industrial arts as a subject area has been an integral part of the schools' offering since it was introduced into the secondary school curriculum in 1951. At the time of its introduction, industrial arts was a mandatory subject for all Grade 7 students, while it was an elective subject for students enrolled in Grade 8 through Grade 12. The learning activities that comprise industrial arts at both levels of education may include the following: Power Mechanics, Electricity and Electronics, Metalwork, Woodwork, Construction, Drafting, Graphic Arts, and Ceramics. Grade 7 industrial arts students are taught a number of these learning activities in a general shop where three or more activities are in progress concurrently. Industrial arts offered to Grade 8 through Grade 12 students is taught in a unit shop where students concentrate on one of the nine learning activities. However, due to the shortage of facilities, not every school is equipped to offer all nine learning activities that comprise the instructional content for industrial arts.

Although numerous problems have confronted the offering of the industrial arts program at the secondary school level since its implementation in 1951, an evaluative study of this subject area had never been conducted from the national perspective by either the Ministry of Education or any other organization, private or public. These problems need to be identified through research, and the possible solutions recommended to the proper authorities. It was incumbent that a Thai researcher, whose specialty is industrial arts, conduct a nationwide evaluation of industrial arts to determine the relevance of the program so that students can become technologically literate for the 21st century.

Purpose of the Study

The purpose of this study was to evaluate the industrial arts program in Grades 7 through 12 in 34 selected secondary schools in Thailand. Evaluative criteria determined the strengths and weaknesses of various components of the program as perceived by the Self-Evaluation Committee (principal, industrial arts department head, industrial arts teachers, and students in the industrial arts program) in each participating secondary school.

Need for the Study

In Thailand, it is acknowledged that there are a number of problems that confront the offering of industrial arts in the secondary schools of Thailand, and an evaluation of the program on a national scope is long overdue. The only evaluation of industrial arts in Thailand was conducted over two decades ago by Vilaiprom in 1971. This evaluation involved 13 comprehensive high schools that were part of the Comprehensive School Project. This project was a joint venture of the Ministry of Education and the Canadian International Development Agency (CIDA). A detail report of that investigation will be given in a subsequent section of this study.

There is a need for an up-to-date evaluative study to determine the relevance of industrial arts if it is to prepare students to become technologically literate for the 21st century. This need may be satisfied when recommendations and suggestions are made to the Ministry of Education for the improvement of the industrial arts program to make it relevant to secondary school students in Thailand in the year 2010.

Statement of the Problem

The major problem of this study was to evaluate the industrial arts program in selected secondary schools of Thailand using the 1987 edition of Section 4-16, *Technology Education (Industrial Arts) Evaluative Criteria* of the National Study of School Evaluation (NSSE).

Supporting Research Questions

In order to achieve the purpose of the study, the following research questions were used to guide data collection from the Self-Evaluation Committee in each of the 34 participating schools.

1. Were the stated *major expectations* for the industrial arts program in secondary schools in Thailand consistent with the schools and community characteristics and appropriate for the needs and interests of the students?

2. What were the problems related to the *organization for instruction* of the industrial arts program in secondary schools?

3. Were industrial arts *course offerings* in secondary schools consistent with the school and community characteristics and appropriate for the needs and interests of the students?

4. Were members of the industrial arts *faculty,* technically competent in the assigned teaching area(s)?

5. Did *instructional activities* of the industrial arts program in secondary schools effectively relate to students' needs and program goals?

6. Did the scope, the quality, and the quantity of *instructional materials* and media of the industrial arts program in secondary schools adequately meet the program goals?

7. Were the results of the *students' assessment program* being effectively used for assessing students' achievement and students' strengths and weaknesses?

8. Were the *facilities and equipment* of the industrial arts program in participating secondary schools conducive to the achievement of the major expectations, goals, and objectives?

9. Did the *learning climate* of the industrial arts program support the attainment of the program's major expectations, goals, and objectives?

10. What were the perceived *outcomes*, both positive and negative of the industrial arts program?

11. What were the *feelings and concerns* expressed by the four major stakeholder groups with regard to the operation of the overall industrial arts program in secondary schools in Thailand?

Significance of the Problem

Education is a dynamic process that helps perpetuate a society. For this reason, periodic evaluations of education are necessary to produce data about the relevancy and the adequacy of various programs that are offered in the formal setting of a school. This study was an attempt to provide such data about the industrial arts program offered in selected secondary schools in Thailand. The data obtained helped to uncover areas of strength and weakness in the program. The results may have significance for curriculum planners of the Ministry of Education as they move to improve, to further plan, to expand, and to develop a more effective and relevant industrial arts program for students who will be enrolled in the secondary schools by the year 2010. These same personnel may find significance in the results of the study as they modify the planning, the financing, and the restructuring of the industrial arts program to make it relevant for the 21st century.

Furthermore, the findings of the research may have significance for industrial arts teachers of Thailand as it may assist them in improving their teaching program and updating it to become more effective and meaningful for the learner. The results of the study may have significance for both the parents and the public to show the effectiveness of the industrial arts program, and thus offer program accountability to students, parents, and educational leaders.

Teacher educators in Thailand may find the results of this study significant as they plan to reorganize and restructure the program that is used to prepare industrial arts teachers for the schools of the nation. These findings will point out what "should be" and not "what is." These findings should provide direction to teacher educators and the program they offer to prospective industrial arts teachers to increase its relevancy for those who will teach this subject in the next century.

Description of the Study

This evaluative study was both descriptive and analytical. The study involved 34 randomly selected secondary schools of three different sizes from all 12 educational regions of the country. The secondary educational system of Thailand is comprised of 1776 secondary schools. These were stratified according to size (small, medium, and large). A table of random numbers was used to select secondary schools of three different size: from all geographical areas of the nation. In each school a Self-Evaluation Committee was established. These committees used the Thai version of *Section 4-16, 1987 Edition of the Evaluative Criteria of the National Study of School Evaluation* as the evaluation instrument.

Definition of Terms

The following terms are defined for clarity and for consistent understanding of their application throughout the study.

Evaluation

"A series of activities designed to determine the effectiveness or value of a course, instructional program, exercise, etc" (Ellington & Harris, 1986, p. 59). Evaluation can be one of four types: student evaluation, program evaluation, facilities evaluation, or curriculum evaluation (Ellington & Harris, 1986, p. 59).

"The determination of the worth of a thing. It includes obtaining information for use in judging the worth of a program, product, procedure, or objective, or the potential utility of alternative approaches designed to attain specified objectives" (Worthen & Sanders, 1973, p. 19).

Evaluative Criteria

The Evaluative Criteria were designed to serve the needs of various types of secondary schools and programs, based on the principles that a school should be judged in terms of what it is striving to achieve (its philosophy and goals) and according to the extent to which it is meeting the needs of the students enrolled and the community it serves (National Study of School Evaluation, 1987, p. 5). These criteria were used by a Self-Evaluation Committee in the schools that were involved in the research. A copy of the Technology Education (Industrial Arts) evaluative criteria is found in Appendix A.

General Shop

"A shop in which two or more activities, such as woodworking and metalworking are organized and carried on concurrently under the direction of one teacher" (Silvius & Curry, 1956, p. 460). A synonym to this term is a multiple activity laboratory. Multiple activity laboratory is defined as, "A school industrial laboratory designed and equipped to offer instruction in a variety of industrial or technical areas for breadth or depth purposes in industrial education" (Silvius & Curry, 1971, p. 594).

The Unit or Single Activity Shop

"The unit shop is the oldest type of school shop. As the name implies, it houses one single type of work, such as woodwork, electricity, automotive work, etc. . . . Unit shop programs are often "enriched" or "generalized" beyond earlier traditional practices" (Ericson, & Seefeld 1960, p. 307).

Program

An ordered set of activities, presentations, etc.; e.g., a structured sequence of related learning activities, or a planned schedule for the implementation of a project or policy of some sort (Ellington & Harris, 1986, p. 133). Pautler (1978) defines a program "as the pursuit of a certain specialization such as cosmetology, electronics, etc." The author continues by relating a course to a program. A "course is defined as one segment of the total program." (p.52)

Program Evaluation

"The assessment of the value, worth or merit of a particular educational program. Such assessment provides the information necessary to determine if program goals are being met" (Dejnozka & Kapel, 1991, p. 208).

"Those procedures, guidelines and basic assumptions that define how an evaluation process will be conducted" (Stufflebeam, 1983, p. 332).

Self-Evaluation Committee

A Self-Evaluation Committee for small-size sample schools involved in this study comprised the principal, the industrial arts teacher/department head, and two industrial arts students. For medium-size and large-size sample schools, and additional industrial arts teacher was added to a Self-Evaluation Committee.

Delimitations

This study was delimited in the following manner:

1. To the examination of the industrial arts program of 34 participating sampled schools from 12 educational regions of the country.

2. The study was restricted to the survey of the opinions and perceptions of members from four major stakeholder groups which formed the Self-Evaluation Committee in each of the 34 participating sampling schools.

3. The primary source of data was through the evaluative criteria that were used between, May 1, 1993, and September 30, 1993.

Limitations

The study was affected by the following limitations:

1. Only the industrial arts program in 34 participating sampled schools from all 12 educational regions of the nation were examined.

2. The validity and reliability of the Thai translation of Section 4-16 of The Evaluative Criteria were not completely known and thus definite limitations were placed on the study. This limitation was imposed on the study because this was the first time that these criteria were used on a nationwide basis in Thailand.

3. The findings were limited to the populations who were involved, and any generalizations to other populations must be done with caution.

4. The quality and quantity of data collected were limited by the degree of cooperation given by the participants in completing the evaluative criteria.

5. The possibility of the participants misinterpreting the meaning of the statements, or not being able to fully express their views within the format of the evaluative criteria, imposed a limitation.

6. Portions of the data for the study particularly major expectations, judgments and recommendations, and comments were based upon the perceptions of members of the Self-Evaluation Committees which were recognized as being subjective in nature.

7. One evaluation instrument was used to obtain data from all four groups that formed an evaluation committee. Thus, the wording of the statements and questions of the evaluation criteria were not as definite as they might have been had a separate instrument been designed for each group.

Assumptions of the Study

In order to achieve the purposes of this study, the following assumptions were made:

That the data necessary for completing the study would be gained from the 34 Self-Evaluation Committees from the 12 educational regions of the country.

That the perceptions of the members who formed each Self-Evaluation Committee varied in position and degree and were affected by such factors as the following: a) their understanding of the purpose of the industrial arts program in secondary schools, and b) the clarity and consistency of communication within schools and between the schools and the Department of General Education, Ministry of Education.

That the procedures used for data analysis possessed validity and reliability.

That members taken from the four major stakeholder groups to form the Self-Evaluation Committee were representatives of the referent group.

That the data collected with the evaluative criteria would accurately reflect the opinions and perceptions of these four major stakeholder groups.

The following chapters of this report will have this organization:

Chapter II will review the literature and the research that is related to this study.

Chapter III will present the methodology that was used to collect data for analysis.

Chapter IV will analyze the data that were collected in the 34 selected schools.

Chapter V will present the finding, conclusions, recommendations, and observations of the study.

CHAPTER II

REVIEW OF LITERATURE AND RELATED RESEARCH

Introduction

The content of the previous chapter presented an introduction to the research and an overview of the research methodology. This chapter is divided into three major segments.

The first segment will enable the reader to obtain an historical overview of Thai education and gain some insights into structure of secondary education at the national level and how industrial arts fits into that structure. The content of this segment should help the reader develop an understanding of the system of education that is in place in Thailand. Emphasis will be placed on the development of industrial arts as part of the secondary education program that is available in the secondary schools of Thailand.

The second segment of this chapter will report on evaluation models for program evaluation that are advocated by leading theorists. Emphasis will be placed on the evaluation model advocated by NSSE for total program evaluation of secondary schools.

The third section will focus on research investigations that have been completed and are related to the current study.

A Historical Overview of Thai Education

The present educational system of Thailand has been forged and tempered over the past seven centuries by many forces and influences. The Thai educational system of the past was quite similar to that of the monastic and cathedral schools of Medieval Europe, because education had a religious orientation and was offered in the Buddhist temples (Educational Planning Office, 1966). This system was informal and offered limited subject matter that provided moral and religious instruction to only male members of Thai society. Family units were responsible for vocational training. Fathers provided their sons with basic skills in farming, hunting, fighting, and trades. These skills, once acquired, were passed from one generation to the other. Girls were taught homemaking and handicraft skills by their mothers in the home. It was a common practice for children of wealthy families and the upper class of society to receive training in the arts and other aspects of education (Educational Planning Office, 1966).

The history of education in Thailand can be divided into three discrete but overlapping periods:

1. The Traditional Period, from 1257 to 1867;
2. The Educational Expansion Period, from 1868 to 1931; and,
3. The Present Period, from 1932 to the present time.

(Educational Planning Office, 1966, p.1)

The Traditional Period (1257-1867)

King Ram Khamhaeng of the Sukhothai Period, in 1283, developed the Thai alphabet that has been in continuous use since its formulation. This alphabet has been modified from time to time until the current system of writing evolved. Literature of the Sukhothai Period shows that generally only male members of the predominant society were provided with the opportunity to become literate. This was accomplished by having these individuals take lessons either in the royal court or in Buddhist temples.

This form of Monastic education originated at the beginning of the Sukhothai Period (1257-1377) and was centered in Buddhist temples, remaining relatively consistent for six centuries. Monastic education progressed throughout the Sukhothai Period (1257-1377); the Ayudhya Period (1377-1767); the Dhonburi Period (1767-1782); and the first stage of the Ratanakosin Period in 1868 (Educational Planning Office, 1966). With education from 1251 until 1860 considered the responsibility of Buddhist monks, the government took an inactive role in providing public education. As a consequence, Buddhist monks were the key persons that provided education to the public (Educational Planning Office, 1966).

Thai people first came into contact with westerners during the middle of the Ayudhya Period (1377-1767). The first of the westerners who arrived in 1511 were the Portuguese. Approximately a century later, in 1662, French missionaries also entered Thailand. The primary purpose of these missionaries was to spread Christianity throughout the country. In addition to bringing their religious belief with them, these westerners also brought with them many skills and new technologies which helped education to progress during this period. Private schools also were established by Christian missionaries to teach Christianity and western culture to the Thai people. During the Ayudhya Period, these private Christian schools remained under tight control of King Narai because he was suspicious of the motives of the westerners who operated these schools.

It was during the reign of King Narai that Thai literature reached its pinnacle. Thai education placed emphasis on the development of reading and writing skills; as a result, new textbooks that further developed these skills were compiled. This accomplishment had an impact on the nation's literary heritage. The books that had been developed during this time were widely used until the early Ratanakosin Period (Educational Planning Office, 1966).

The beginning of the present dynasty (Chakri), in 1782, had as its hallmark a new emphasis for improving education and encouraging cultural development. The first two kings of Chakri Dynasty, King Rama I and King Rama II, authored several books and encouraged other authors to follow suit. Many great Thai poets, including King Rama II, produced a number of literary masterpieces. Among these masterpieces was Ramakian, the Thai version of Indian Ramayana.

Once again, during the reign of King Rama II at the beginning of the Ratanakosin Period in early 1900, Thai people were brought into contact with western countries. This occurred when Presbyterian missionaries from Europe arrived in Thailand to teach religion. Later on, during the reign of King Rama II, American missionaries also entered the country for religious and educational purposes. The American missionaries contributed greatly to the improvement of Thai education when they established a printing house in 1837 to print books in Thai (Educational Planning Office, 1966).

It was a common practice prior to this period that all knowledge and skills were kept secret among family members in order to eliminate the competition in their trades from other people outside the family. In this period, however, learned men were urged to record their knowledge in written texts so this information could be made available to the public. After Wat Prajetubhon, a royal temple in Bangkok was renovated during the reign of King Rama III in early 1900. When this renovation was made, the king had many texts inscribed on stone slabs and had these slabs attached to the temple walls to enable the public access to the knowledge. This royal temple eventually became the first public university in Thailand.

As a result of this educational relationship with western missionaries, Thailand developed very close partnerships with western countries. Because of these partnerships, it became necessary for the Thai people to comprehend and communicate in English. The first Thai who became well versed in English was King Rama IV of Ratanakosin Period. King Rama IV was responsible for laying the foundation for educational reform and expansion of Thai education during the reign of his successor, Rama V.

The Educational Expansion Period (1868 to 1931)

In 1871, King Chulalongkorn (Rama V) of Ratanakosin Period opened the Royal Command School on the palace grounds in Bangkok. This was the very first non-sectarian school in the country. The major purpose of this school was to train boys so they could become "well-read men of good behavior" (Educational Planning Office, 1966, p. 3). This school differed from other schools that were in place because it had regular instructional time, and laymen rather than Buddhist monks were hired to teach. The Royal Command School offered a wider range of subjects than did the schools that were operated by the Buddhist monks. These subjects were required for those who worked as government officials (Swasdi-Panich, 1966).

More schools were established in 1884 because of an increased demand for government officials when the government expanded its scope of work to improve the standard of living of the Thai people. As a result of King Rama V's initiation, a new era in the history of Thai education began. Many government schools were established throughout the country to teach children from all segments of society. Public education, which was previously limited to those of the privileged class, was extended to the poor in the provinces where classes were taught by lay people in Buddhist temples. It was the administrative wisdom of King Rama V to promote public education in such a way that lessons were delivered in existing Buddhist temples. This helped to curtail the great expense that would have been incurred in the construction of new schools.

At the national level, the Department of Education was established in 1887; five years later, this Department was elevated to the status of the Ministry of Education. This Ministry had among its responsibilities cultural and religious affairs and educational administration. When this Ministry was established, it also laid the foundation for educational expansion that would take place during the beginning of the 20th century. Part of that expansion was the creation of a nationwide system of examinations and the publication of textbooks that were used to teach the Thai language in the schools (Swasdi-Panich, 1966).

By the end of the 19th century, in 1898, a broader national scheme of education was formulated to deal with all the provinces of the Kingdom. This national scheme of education not only provided curricular outlines to the schools, but established grade levels within the total system of education and included a specific reference to education for girls (Swasdi-Panich, 1966).

The national scheme of education for 1909 divided education into two streams: the academic stream and the vocational stream. Under this education scheme, a 3-3-3-2 educational plan was adopted instead of the former 3-3-3 Plan (Educational Planning Office, 1966, p.4). The first Private

School Act was enacted in 1918. This Act specifically dealt with the registration and government supervision of private schools. Following this Act, in 1921, the Compulsory Education Act, was passed and became the milestone for public education in Thailand. Because of the Compulsory Education Act it became mandatory for all children between the ages of seven to fourteen, both boys and girls, to attend school. The first university in Thailand, Chulalongkorn, was founded in 1916. The national schemes of education during this period were formulated as an effort to prepare youth with suitable economic and vocational skills to meet the economic and social conditions that were in existence.

The Present Period (1932 to the present)

A new era for education in Thailand began in 1932 when the new revolutionary government took over and asserted many efforts to improve the educational system. The philosophy of that government was that educational emphasis should be in harmony with the social and economic needs of the political system of the country, as well as meet the needs of the individual. During the 30 year period between 1930 and 1960, several national schemes for education were established. The first National Scheme of Education was put in place in 1932 when the revolutionary government assumed power and organized elementary and secondary education on a 4-4-4 plan from the previous 3-3-3-2 plan. This plan meant four years of elementary education, four years middle school education, and four years high school education. The government appointed an educational council of selected educators to serve as an advisory body to help implement its plan for education. It was the Educational Council which formulated the revised Compulsory Education Act of 1935. In the following year, the 1936 National Scheme of Education was amended so the basic organizational scheme for education was changed to a 4-3-3-2 plan: four years of elementary education, three years of lower secondary education, three years of upper secondary education, and two years of pre-university education. Also in 1936, the Private School Act became law. This Act made provision that financial assistance would be advanced to these schools. Another provision of The Private School Act was for school inspectors from the Ministry of Education to visit private schools to be certain that all private schools in the country followed the curriculum and educational policies of the Ministry of Education (Educational Planning Office, 1966).

In 1936, there was a rapid expansion of elementary education throughout the country because of certain "provisional articles" in the constitution. The constitution explicitly stated that Parliament was to be composed of two types of members: elected and appointed, and that only those provinces where more than half of the adult population were literate would have full representation. To meet this requirement, the government spent a considerable amount of the budget on a literacy campaign. The result was that very little of the budget remained for the development of secondary education. Thus, secondary education was decreased to six years from Grade 5 to Grade 10. For selected students from Grade 10 who would enter university, the government established a number of pre-university schools. For those students who did not want to continue their education at university, they could enroll in higher vocational education schools. The government wanted to encourage the students to be trained for some kind of a vocation that involved psychomotor skills. To achieve this purpose, the government established what was called lower level vocational education which was placed in the schools from Grades 5 to 7.

Lower level vocational education schools did not became popular because of negative attitudes held by the public toward vocational education. As a result of these attitudes, only poor achieving students continued their education in vocational education schools. In addition, there were several other factors that influenced the decline of enrollment in vocational education schools. Among these factors were low achievement in academic subjects, poor physical facilities, and teachers who were neither professional teachers nor skilled tradesmen. Later, enrollments in vocational education schools showed a drastic increase when the Ministry of Education made it a practice to employ graduates of vocational education schools as elementary school teachers. When the Ministry ceased the practice of recruiting vocational education graduates to teach in elementary schools, enrollments in vocational education schools reversed and showed a decline.

When the Government established its policy to curtail expenditures for academic secondary schools, a limited number of these secondary schools were retained as examples for private schools to emulate. As a result of this policy, the majority of high school students attended private schools. This policy also caused concentration of educational resources to be centered in the Bangkok area and provided for the rapid expansion of private secondary schools in the nation.

A number of incidents occurred during World War II that had an impact on Thai education. For instance, as a result of the war, regular school activities and functions were greatly curtailed. During hostilities, children had to be evacuated from the schools. As a result most schools were closed. School closure forced students to study at home and to sit for examinations that were administered by personnel of the Department of Education. After the war, academic standards in the schools continued to decline steadily despite rising industrial development and an increase in the standard of living.

Another National Scheme of Education, adopted in 1951, had slight modifications from the previous schemes. In this education scheme, the school system was reorganized so it consisted of: 4 years of elementary education (Grades 1 to 4); 3 years of lower secondary education (Grades 5 to 7); 3

years of upper secondary education (Grades 8 to 10); and 2 years of pre-university education (Grades 11 to 12). At the lower secondary education level, three streams of education became available: the academic stream for those students who wanted to go to college; the vocational education stream for students who wanted to seek employment earlier; and the general stream for those students who would not further their education beyond Grade 7. At the upper secondary education level, students could enroll in either the academic stream or the vocational education stream. The vocational education stream at the upper secondary level was a three-year program that was organized to parallel the two years of pre-university education. The government anticipated that more students would further their studies in vocational education schools. In reality, the opposite proved to be true when very few students actually enrolled in vocational education schools. The majority of lower secondary education students attempted to enter the academic stream because of the prestige associated with white collar occupations and the limited number of jobs available in industry or commerce.

To attract more students and to fulfill requirements for semi-skilled and skilled workers, the government made an attempt to improve vocational education school by providing these schools with better facilities, by attracting more and better qualified teachers, and by diversifying the courses that were offered.

To facilitate the various new plans for education and curricular changes, the Ministry of Education divided the Kingdom into 12 educational regions with a regional officer in charge of each region. In each region, as well as in a province, an Advisory Committee was established and was given the mandate to consider problems that were related to education. The National Education Council, an agency responsible for coordination of all aspects of the country's education, was established in 1959.

The National Scheme of Education, 1960, placed emphasis on meeting the needs of the individuals and of society. This scheme extended primary education through Grade 7 and introduced curricular experimentation at the secondary education level. The pilot comprehensive high school resulted from curricular experimentation. In this type of school, both academic and pre-vocational education subjects were taught. This change was regarded by educationalists as the most innovative change in the secondary schools of the country. When this innovative curricular change was implemented, it was intended to meet the needs of students who would not continue their education at the post-secondary level. No barriers were to obstruct those students who wished to further their education at an institution of higher education.

When the current National Education Scheme was implemented in 1977, the grade structure for education was changed to a 6-3-3-4 organizational pattern from the 7-3-2-4 pattern used since 1960. Under the new organizational pattern, students can progress through six years of compulsory elementary education (Grades 1 to 6); followed by three years of lower secondary education (Grades 7 to 9); three years for upper secondary education (Grades 10 to 12); and four years of college education (Grades 13, 14, 15, and 16).

The Ministry of Education

In Thailand, both the public and the private sectors are involved in managing secondary education. Public and private secondary schools are under the control of a strong centralized Department of General Education, which functions under the Ministry of Education. The Ministry of Education is the responsibility of the Minister of Education who is appointed from the ruling political party and is responsible for establishing regulations, policies, and legislation that govern education. Functioning under the leadership of the Minister of Education is the Director General of Education, and civil servants of the Ministry, who perpetuates the system. There are other government agencies under the Ministry of Education that are involved in secondary education. One of these departments is responsible for vocational education courses at the secondary school level. These agencies include the Fine Arts Department and the Vocational Education Department. The Ministry of Education in Thailand consists of the following offices or departments:

1. The Office of Permanent Secretary of Education

2. The Department of General Education
3. The Department of Teacher Education
4. The Department of Religious Affairs
5. The Physical Education Department
6. Department of Curriculum and Instruction Development
7. The Fine Arts Department
8. The Vocational Education Department
9. Department of Non-formal Education
10. Office of the Private Education Commission
11. Office of the National Culture Commission
12. The Institute of Technology and Vocational Education
13. Office of the National Primary Education Commission
14. Office of the Teacher Civil Service Commission

The Office of the Permanent Secretary of Education is headed by a Permanent Secretary, a civil servant who with four Deputy Permanent Secretaries coordinate policies and implementation of education programs of the 13 Departments. Each of these departments is headed by a Director General who is responsible for providing leadership and seeing that the laws and policies are carried out and enforced. For instruction and supervision purposes, Thailand is decentralized into 12 educational regions. Each region has a regional education office that is directly responsible to the Office of the Permanent Secretary of Education. Regional offices are under the direction of a regional educational officer who is a civil servant. The Inspector-General of the Ministry of Education, a civil servant, is directly responsible to the Permanent Secretary. Personnel of the Inspector General's Office are assigned inspection functions for the different educational regions. At the provincial and district levels, each Department of the Ministry of Education maintains close and direct links with the schools and institutions for which it is responsible.

The System of Education in Thailand

Education in Thailand is perceived by the populace and the various levels of government as an essential means for the progress and preservation of a democratic society and national development. This can be clearly observed in the policies, guidelines, official communications, and edicts emanating from the Ministry of Education and other ministries of the government.

Structure of Educational System

Education in Thailand is considered to be a lifelong process. According to the National Education Scheme of 1977, there are four major sequential levels of formal education. These levels include pre-primary, primary, secondary, and higher education. Formal education is considered to be education that takes place in a school recognized by the Ministry of Education where instructional content is taught by a certified teacher. Non-formal education is offered to those working adults who cannot access the formal education system. This type of education provides an opportunity for working adults to upgrade their education while holding permanent jobs. Non-formal education in Thailand is offered either as an extension course or as an evening course in educational institutions throughout the country. In addition, non-formal education is regarded as an integral part of the formal educational system.

Pre-primary Education

The purpose of pre-primary education, according to the National Education Commission (1988), is to encourage "the harmonious physical, intellectual, emotional, and social development of a child prior to formal education" (p. 7). Education at this stage includes postnatal care as well as the nurture of pre-school children between the ages of three-and-a-half and five years. Agencies involved in this portion of education provide care and socialization education and include the home, child care centers, nursery schools, and kindergartens.

Primary Education

Pre-primary education is followed by primary education that is compulsory and free to all children between seven and fourteen years of age. Elementary education provides the foundation for the overall growth and further education of children, beginning at Grade 1 and continuing to Grade 6. According to the National Education Commission (1988), the aims of primary education are the following:

> To help pupils achieve permanent literacy in reading, writing, and arithmetic and to provide sufficient basic skills and knowledge among pupils. Primary education enables pupils to earn a living and be law-abiding and socially conscious citizens under the constitutional monarchy. (p.8)

Secondary Education

Following primary education is secondary education, which includes all the curricular and extra-curricular activities for preadolescent and adolescent groups. Secondary education is divided into two levels: lower secondary education and upper secondary education, each covering a three year period. Academic subjects include: Thai Language; Social Studies; Physical Education; Science; and Mathematics. Vocational education subjects include: Power Mechanics; Electricity and Electronics; Metalwork; Woodwork; Construction; Drafting; Graphic Arts; and Ceramics. The upper secondary level is made up of Grades 10, 11, and 12 where specialized studies are offered, leading to either post-secondary education or employment in the world of work. In these three grades, the students rely upon the academic and the vocational foundations acquired in the grades of lower secondary education. Subject offerings in the industrial arts program in secondary schools generally include Power Mechanics; Electricity and Electronics; Metalwork; Woodwork; Construction; Drafting; Graphic Arts; and Ceramics. At the upper secondary level, students who are taking any of these courses as vocational education are required to spend six hours per week working in industrial arts shops. This approach is used because there are an insufficient number of vocational education schools in areas outside the major population centers.

Higher Education

Higher education aims at the full development of the national human resources to facilitate the advancement of knowledge and technology. This will articulate to the production of high level academic and professional manpower for national development. Higher education is offered through universities, colleges, and institutes for specialized studies. Due to the limited facilities in public colleges, secondary school graduates who wish to gain admission to public universities must pass a joint entrance examination that is administered by the Ministry of University Affairs. This examination is based on academic competition. In response to the demand for greater access to higher education, especially by secondary school graduates and working adults, two open universities have been established to provide greater opportunity and access to higher education. These two open universities use the distance learning concept that involves the various channels of mass media such as television, radio, and correspondence courses for the delivery of instructional content. Since class attendance is not required at an open university, the number of students enrolled has increased considerably. Higher education in Thailand is under the auspices of the Ministry of University Affairs, of which a large portion is the responsibility of the Ministry of Education.

Educational Administration

The administration of education in Thailand is a three-tiered system that parallels others sectors of public administration and includes the central or national, the regional, and the local levels. There are three national ministries and a commission in Thailand that are responsible for education: the Office of the National Education Commission, the Ministry of Education, the Ministry of Interior, and the Ministry of University Affairs.

The Office of the National Education Commission is responsible for national education policies and development plan formulation. When these policies and plans are completed, they are transmitted to the ministries concerned for implementation. The Ministry of Education is responsible for both primary and secondary education as well as teacher and vocational education, including non-formal education. The Ministry of Interior is responsible for municipal primary education throughout the country. The Ministry of University Affairs is responsible for post-secondary education that is made available at public and private universities and colleges.

During the past two decades, Thailand has achieved considerable success in expanding education at the primary, secondary, and higher levels throughout all regions of the country. Despite the progress the government has made with educational development, critical problems and issues remain. Many of the educational problems that needed to be solved were pointed out by the Office of the Educational Commission in its 1989 report.

> Problems still encountered in formal education development are on quality improvement and relevance of curriculum, educated unemployment, mobilization of resources, etc. . . . For those in non-formal education, the major problems are inadequate coordination among agencies involved in the undertakings of non-formal education programs, management systems, insufficient personnel at the operational levels to develop and manage the programs, lack of administrative unity, shortages of equipment and facilities needed to diversify services and extend coverage to rural areas, and insufficient systems of supervision, coordination and resource mobilization.(p. 22)

As a consequence of these problems, the Office of the National Education Commission deemed it necessary to reconsider the National Education Scheme of 1977. Consequently, the conceptual framework for national education was drafted and practical action was taken to complete the task. Since Thailand is in the process of becoming a newly industrialized country, it is necessary for the educational system to respond to the manpower needs of the nation.

The Comprehensive School Evolution

Vilaiprom (1971) traced the development of the first comprehensive school in Thailand to 1951 when a pilot school at Chachoengsoa, Chachoengsoa Province, was established under the auspices of the United Nations Educational, Scientific, and Cultural Organization (UNESCO). Three years later, in 1954, the School at Cholburi, Cholburi Province, participated in this project. However, both of these schools reverted to their traditional status in 1955 when UNESCO withdrew its support, and money was no longer available to continue this project.

Following a tour of educational institutions in Europe, in 1960, by the Minister of Education, M. L. Pin Malakul, the first permanent comprehensive secondary school, Suranari Withaya was opened at Korat (Nakorn Rajasima), Nakorn Rajasima Province. In this secondary school for girls, the lines of discrimination between the academic and the vocational education streams were less rigid than in other schools. Crossovers by students in this school were possible. Because of the success of this school, the Ministry of Education, in 1965, converted another secondary school in Korat to the status of a comprehensive school. Rajasima Withayalai School was a secondary school for boys. These two schools made a significant contribution to Thai education because in these schools the dropout problem decreased and the attitudes of students and parents toward vocational education became more positive.

A report issued by the Educational Planning Office, Ministry of Education (1966), shows that the Committee for the Comprehensive Secondary School was established the previous year. One of the major recommendations made by this Committee was that the concept of the comprehensive school be expanded upon using as a model the two schools in Korat. This recommendation was supported by the Research Committee on

Secondary Education and Human Resource Development. As a result, the expansion of comprehensive schools became a national policy (Educational Planning Office, 1966).

The cabinet informed the Committee on a Loan Program for the Improvement of Education that Canadian funds were available for development projects in Colombo Plan Nations. Cabinet instructed personnel of the then Department of Secondary Education (now the Department of General Education) to draft a loan proposal for transmittal to the Government of Canada for its consideration for support (Vilaiprom, 1971).

It was evident that assistance from Canada was predicated upon these facts:

> 1. Canadian educators have had a great deal of success in establishing and operating comprehensive schools.
>
> 2. There was a ready pool of educational experts whose expertise and knowledge could be used in guiding educators in Thailand in organizing and operating comprehensive schools. From this pool of experts there could be drawn specialists in educational administration, in guidance and counseling, in industrial and vocational education, and in curriculum.
>
> 3. The Government of Canada offered to loan one million dollars over a long term on an interest free basis to the Government of Thailand with the provision that this money was to be spent to improve education and to purchase educational hardware made in Canada. (Vilaiprom, 1971, p. 39)

Before granting the loan and becoming involved, the Government of Canada sent a team of educators to Thailand to study the feasibility of the Loan Proposal submitted by Thailand. The leading educator of this team was the Dean, Faculty of Education, University of Alberta. From the recommendations made in the team's report, the Government of Canada approved the proposal for funding. A major component of the proposal was that funds would be made available for the training of teachers and supervisors in a Canadian University over a three year period. When the proposal was funded by the Government of Canada through the Canadian International Development Agency (CIDA), it become known as

The Thailand Comprehensive School Project.

The Thailand Comprehensive School Project

The Thailand Comprehensive School Project was a five year project initiated in 1966 and terminated in 1971. This project was a joint venture of the Government of Canada through (CIDA) and the Government of Thailand. The major goal of the Thailand Comprehensive School Project was to assist the Department of Secondary Education, Ministry of Education to establish, equip, and organize diversified programs in 20 existing secondary schools by converting these schools to comprehensive schools that could offer a diversified program at the lower secondary education level (University of Alberta, 1972).

To implement the project, the following were provided: a long term, low interest loan to permit the purchase of equipment in the Project schools; a training program at the University of Alberta to orient Thai supervisors and teachers to the philosophy, organization, and administration of a comprehensive school; a team of highly qualified advisorconsultants to Thailand to provide leadership to the project (University of Alberta, 1972). The Thailand Comprehensive School Project was soundly conceived and all 20 comprehensive schools were operating between 1966 and 1971 and followed the philosophy for a comprehensive school.

The University of Alberta was selected as the Canadian University to be involved in the program for people who would work in the project schools. This university was selected because Alberta has the most success in Canada with the comprehensive schools concept and because the University of Alberta has a most successful teacher education program for industrial arts teachers. According to the terms of the contract, supervisors, administrators and teachers from each of the 20 project schools would be involved in the training program that was organized over one calendar year. This training program had the following components: summer language program, theoretical aspects of educational administration, practicum, industrial arts experience, and related courses.

The training program for the Thai educators of the Comprehensive School Project was conducted in the Department of Educational Administration at the University of Alberta between 1966 and 1971. The goal of the university portion of the Training Program was to help prepare Thai supervisors and teachers for their future duties in the comprehensive schools upon the completion of their university training. The training program of the project was designed to be flexible in programming, to blend theory with practice, and to orient trainees with a pre-session language prior to commencement of training (University of Alberta, 1972). To achieve these goals, all Thai trainees were admitted to the Graduate Diploma Program of the Faculty of Education and were required to complete common core courses related to an area of teaching specialization, to participate in practicum in Alberta Schools, and to take a summer language program (University of Alberta, 1972). To be eligible for a Graduate Diploma, project students had to fulfill the requirements for the certificate that were established by the Faculty of Education. Before the official termination date of the training program, it was extended for another two years .

The Alberta Training Program was perceived by Thai participants as "being of lasting value to the trainees" (University of Alberta, 1972, p. 34). This perception was supported by the findings of Taenglian (1972) in his research "A Student's Evaluation of the Alberta Training Program for the Thailand Comprehensive School Project" in which he concluded that "the Alberta Training Program was perceived as very useful to the participants in their future duties upon returning to Thailand" (Taenglian, 1972, p. IV).

Originally, it was proposed that by 1969, 20 existing general secondary schools were to be converted into comprehensive schools. It soon became evident to facility planners that this timeline for school conversions was unrealistic and would have to be extended. Through negotiations between both levels of government, the Government of Canada approved and granted to the project 30 additional scholarships for the 1969-1970 academic year. Of the 30 scholarships, five were for Master Degree students in educational administration, curriculum, mathematics, and industrial arts (Vilaiprom, 1971).

Industrial arts in project schools was taught in either a comprehensive general shop or in a limited general shop. In either learning environment, the following learning activities could be taught: Power Mechanics, Electricity and Electronics, Metalwork, Woodwork, Construction, Drafting, Graphic Arts, and Ceramics. In project schools, industrial arts was mandatory for all Grade 8 students; at other grade levels of secondary school, it was an optional subject. Time allocation for industrial arts at each grade level varied from a high of 250 minutes per week to a low of 100 minutes per week (Vilaiprom, 1971).

Five years after the date when external funding from the Canadian International Development Agency ceased to exist The Comprehensive School Project was terminated by the Ministry of Education. The major reason given by the Ministry for this decision was the comprehensive school was too expensive in its operational costs.

The Development of the Industrial Arts Program in Secondary Schools in Thailand

Industrial arts was first offered in a secondary school in Thailand in 1951. This school, located in the town of

Chachoengsoa, Chachoengsoa Province, was a pilot project school established under the United Nations, Education, Science, and Culture Organization (UNESCO) sponsorship. This project was extended to another school in the town of Cholburi, Cholburi Province, in 1954. It was rather unfortunate that shortly after UNESCO withdrew its sponsorship, both schools reverted to their former general academic status. Later in 1960, industrial arts was reintroduced as a subject area and was offered in the nation's first comprehensive secondary school, Suranari Withaya Girls' School, located in Nakorn Rajasima Province. When this subject area was first offered at this school, all lower secondary level students were required to take a practical course from agriculture, home economics, business, or industrial arts. Industrial arts that were offered were limited to Ceramics, Drafting, and Electricity and included learning activities that were regarded as suitable for girls. Clearly, the most significant impact that this school had on its students was to bridge the chasm that existed between academic and practical studies. However, the number of comprehensive secondary schools established between 1960 and 1965 was limited to a small number of secondary schools in the country (Upathamp, 1973).

The success of the first comprehensive school for girls as a place where they could pursue courses suited to their interests and abilities paved the way in 1965 for the establishment of Rajasima Withayalai Boys' School. This second comprehensive school was located in the same city as Suranari Withaya Girls' school. This boys' school with its diversified curriculum offered a variety of vocational education courses and proved to be equally as successful as the girls' school. The key to the success of these two comprehensive schools was the flexibility of the diversified curriculum that permitted students to explore a wide range of courses and to discover the course which suited their interests, abilities, and career goals. Educational statistics maintained by the Ministry of Education show a steady decline in the dropout rate for these two schools. This phenomenon partly could be attributed to the fact that students in these schools were allowed to pursue courses that were suitable to their aptitudes and inclinations. As a result of the success of these two comprehensive schools, the public's attitudes towards vocational education become more positive (Upathamp, 1973).

In 1965, in response to the need for a broad program of studies in secondary schools, the Ministry of Education established the Committee for the Comprehensive Secondary Schools. According to Upathamp (1973), this Committee recommended that the comprehensive school concept be expanded and used as a model for the two comprehensive schools in Nakorn Rajasima province. The Research Committee on Secondary Education and Human Resources Development, after a thorough study of Thailand's educational needs, gave its support to the recommendation of the Committee for Comprehensive

Secondary Schools. Consequently, the expansion of comprehensive schools became national policy in 1965 when a Comprehensive School Project Division was established in the Department of General Education, Ministry of Education. A year later, Canadian assistance was accepted in principle for the Thailand Comprehensive School Project. The Comprehensive School Project No.1 included 20 secondary schools that were selected by the Department of General Education to operate as comprehensive schools. In April 1967, the schools included in this project received formal approval of the Cabinet to convert to comprehensive schools. Under terms of the Comprehensive School Project, Thai supervisors and teachers were selected by the Comprehensive School Project Division and were sent to the University of Alberta, Edmonton, Alberta, Canada, to pursue a graduate diploma in educational administration. Among the 160 participants in the training project, 31 had an industrial arts background with working experience either as department heads or teachers. When these educators successfully completed the program at the University of Alberta, they returned to Thailand and took key positions in either the Project Office or in the 20 comprehensive schools. These schools were fully operational and existed until 1978 when it was mandated by the Ministry of Education that all secondary schools of the country would use the newly promulgated curriculum of 1978. The Ministry of Education was unable to equip every secondary school in the country with all required industrial arts facilities for a comprehensive school due to insufficient funds. As a consequence, the new curriculum of 1978, which offered limited vocational education courses, was implemented so that schools could offer industrial arts according to the school facilities and available teachers. Nonetheless, those comprehensive schools that were well-equipped did offer a wider range of vocational education courses in order to utilize available facilities to the fullest extent.

Industrial Arts Program in Secondary Schools In Thailand

The success of the comprehensive schools was measured by a decline in the dropout rate and by the number of graduates who continued their education either in vocational education schools or in academic studies at college or university. All secondary schools in Thailand have adopted a diversified curriculum pattern that allowed students to explore a wide range of courses suited to their interests, abilities, and future career goals. This curriculum has been successfully implemented in 20 secondary schools included in the Comprehensive School Project.

Goals of Industrial Arts

Despite the fact that some form of industrial arts has been offered in the secondary schools since 1951, the goals of industrial arts have remained stagnant. The major goal of industrial arts has been to prepare students to meet the needs of both the individual and the Thai society. This goal was achieved by providing students with opportunities to be exposed to the tools, materials, processes, and products of industry through practical hands-on experiences. These experiences served as realistic criteria that aided the student to make a wise future career choice.

To provide direction to the industrial arts program, the Department of General Education, the Ministry of Education, stated the following goals of industrial arts in secondary schools:

> 1. To develop in each student a measure of skill in the use of common tools and machines,
>
> 2. To develop problem-solving skills relating to materials and processes,
>
> 3. To discover and develop creative and technical talents in students,
>
> 4. To provide all-around technical knowledge and skills,
>
> 5. To develop an understanding of our technical world,
>
> 6. To develop consumer's knowledge and appreciation and use of industrial products,
>
> 7. To develop worthy leisure-time interests,
>
> 8. To develop an understanding of the application of science and mathematics,
>
> 9. To provide pre-vocational experience of an intensified nature for those students interested in technical work, and
>
> 10. To provide vocational training for students who would not otherwise have this opportunity. (p. 46)

Organization of the Industrial Arts Program

Industrial arts as a secondary school subject is mandatory for all Grade 7 students, the first year of the lower secondary level education. For Grade 8 and Grade 9 students, industrial arts is an elective subject. At the upper secondary level of education (Grade 10 through 12) industrial arts is made available to the students as an elective subject. The content areas that comprise industrial arts for both levels of education include Power Mechanics, Electricity and Electronics, Metalwork, Woodwork, Construction, Drafting, Graphic Arts, and Ceramics. Since there is a shortage of facilities in some schools, not every school is equipped to offer all the learning activities related to these subject areas. There is a discrepancy among the learning activities that are available between large-size schools in urban areas and small-size schools in rural areas. Typically, large-size urban schools with high enrollments are better equipped and offer all the content areas of industrial arts.

Students at the lower secondary level are provided with a wide range of exploratory experiences in a variety of industrial arts content areas that are taught in a general shop facility in which one teacher teaches the different content areas. These experiences help students to discover their interests, aptitudes, and potential to aid them in making a realistic career choice. Industrial arts courses offered at the lower secondary level place emphasis on basic experiences and understandings that are related to modern industry. These can be achieved by having students work in a learning environment where they have direct experience and understanding with a variety of tools, materials, and processes that are related to industry.

Students at the Grade 7 level spend four hours per week during the school year, exploring learning activities with the various content areas of industrial arts taught at that grade level. In Grade 8, industrial arts students may elect two of the eight content areas and concentrate on these areas for four hours per week. Grade 9 industrial arts students may elect only one of the eight content areas and devote six hours per week working in the area of specialization. The majority of industrial arts program students who complete the program at lower secondary level can further their education at either the higher secondary level or at a vocational or a technical school. Only a small portion of students who complete the lower level secondary education attempt to seek employment in a field for which they have been previously trained.

At the upper secondary level, students who wish to continue in the industrial arts program must have sufficient background in industrial arts at the lower secondary level. This means the completion of all prerequisite industrial arts courses for the upper secondary level industrial arts courses. It is mandatory for industrial arts program students at the upper secondary level to elect one area of specialization and devote six hours per week working in that specialization. These students work in a general unit shop, which is a facility where only one subject area is equipped and taught. Students who successfully complete an industrial arts program at this level of education may continue their studies in either vocational and technical schools or seek a job in the area they were previously trained.

Facilities

The industrial arts program in Thailand is taught in facilities that are categorized as either a general shop or a general unit shop. As a result of budgetary constraints, secondary schools classified as large-size will have both a general shop and a general unit shop as part of the physical plant. Schools classified as medium-size or small-size will have a general shop.

In Thailand, a general shop is organized as a multiple activity laboratory and is equipped with the tools and equipment to provide instruction in two or more content areas of industrial arts selected from these areas: Drafting, Woodwork, Metalwork, Graphic Arts, Electricity, and Ceramics.

A unit shop is organized and equipped with more advanced tools and equipment used to provide instruction in any one area of industrial arts such as Power Mechanics, Woodwork, Metalwork, Electricity and Electronics.

The Industrial Arts Teacher Preparation Pre-Service

For an industrial arts teacher to be proficient and to be successful, he or she does not need to develop as high a degree of proficiency in manual skills as the tradesman. However, that teacher does need qualitative skills to enable the construction of prototypes, mathematical and scientific models, and industrial models and to properly diagnose for satisfactory performance of the learner. (Williams, 1989).

In addition, an industrial arts teacher must be able to operate and service instruments, tools, and machines for peak operation. Qualitative and psychomotor skills help the individual visualize the limits of the application of basic principles as well as the capacities and operating conditions of equipment (Williams, 1989).

A teacher in an industrial arts program, according to Williams (1989), should possess the following qualifications:

> A college graduate who demonstrated competence in the principles of communication arts, mathematics, physical sciences, behavioral sciences, and the educational and managerial sciences. An extensive background in technical theory and applied problem-solving techniques within a field of technical specialization and closely related fields, as well as mechanical and manipulative abilities necessary to the establishment of high level laboratory experiences. . . . the ability to effectively integrate human relations and technical sciences in teaching-learning activities of educational institutions and construction or mechanical industries.(p. 18)

Industrial arts teachers in secondary schools in Thailand hold a Bachelor of Education Degree in Industrial Arts Education from one of 36 teacher's colleges that offer a program. Presently, these 36 teacher's colleges are under the supervision of the Department of Teacher Education, Ministry of Education. These 36 teacher's colleges are evenly distributed geographically. Thus, there is one teacher's college for every two neighboring provinces throughout the Kingdom. Normally, the Industrial Arts Education Program offered at teacher's colleges consists of three major areas:

general education, areas of specialized subject matter, and professional training for teachers.

Objectives of Industrial Arts Teacher Education Program

The objectives of the Industrial Arts Teacher Education Program according to the Teacher Education Council in 1988 were the following:

> 1 To develop a basic understanding of occupational knowledge and specialized subject matter in order to teach at the elementary, junior, and senior secondary school levels.
>
> 2 To discover and develop talents, aptitudes, interests, and potentialities of students in such a way as to guide them appropriately into particular occupational fields.
>
> 3 To appropriately assess students' ability levels as a basis for assisting the learning, teaching, counseling, and disciplining of students.
>
> 4. To utilize community resources for instruction as much as possible.
>
> 5. To identify important tasks and responsibilities of the teaching profession.
>
> 6 To demonstrate effective use and care of tools, equipment, and machines.
>
> 7 To maintain an organized, well managed and safe industrial arts laboratory.(p. 231)

The industrial Arts Teacher Education Program in 1988 consisted of instructional shop work of a non-vocational type, which provided general education experiences that were centered on the industrial and technical aspects of Thai society. These aspects include an orientation to the areas of appreciation, production, consumption, and recreation through actual experiences with materials and goods. Also, the program served as an exploratory experience which assisted in making occupational choices other than teaching.

Professional Improvement of Industrial Arts Teachers Through In-service Activities

Activities for the professional improvement of industrial arts teachers as suggested by Williams (1989) are as follows:

> To participate in technical and professional programs; to work in industry and research; to study literature dealing with technological fields; to take college courses in areas that will improve teaching in industrial education; to attend industrial professional meetings; to engage in individual research problems; to attend industrial seminars and take courses given by industry; and to study new scientific developments and become familiar with how these developments affect industrial practices.(pp. 27-28)

Evaluation Models Program Evaluation

The literature on evaluation models that was relevant to the research problem is reviewed in this section.

Conceptualizing Evaluation

Evaluation is a form of inquiry that assigns some form of value to the possessions and day-to-day or special activities of human beings. The valuing aspect distinguishes evaluation from other form of inquiry. Thus, the mere collection of data does not constitute evaluation; judgments must be made about the data in some implicit or explicit value structure (Worthen & Sanders, 1973).

The term "value" for Stufflebeam (1971a) is very elusive. This author argues that what may be of value to one is not necessarily valuable to another. Also the sources of the values, Stufflebeam indicates, are diverse since what may be worthy in a given situation may be the converse from a different point of view. Determination of values, according to Stufflebeam (1971), is a very delicate if not precarious process because values constitute the most professional task of evaluations.

Evaluation, according to Apple (1974), is a process of social valuing, therefore; the act of evaluation is not neutral(p. 9). This author views evaluation as a process that is inherently vulnerable to human biases and therefore easy to become "target practice" for the critics of evaluation (p. 31). However, to help deter critics of educational evaluation, Cooley and Lohnes (1976) offer suggestions that clear thinking about values is essential in education because all planned educational practice is influenced by the value attached to the educational ends that are sought. Hence, any research into educational activity, argue these authors, has to deal with the problem of evaluation and offer clarification of valuation issues if it is to contribute to the rationalization of education policy (p. 11).

Evaluation Defined

There are as many definitions for the term evaluation as there are authors who have defined this term with no consensus definition being agreed upon. In discussing this handicap, Three types of evaluation descriptions commonly identified are as follows: (1) measurement, (2) congruence between performance and objectives, and (3) professional judgment. More recently, two new definitions have been added to these three. These were evaluation as description and judgment, and evaluation as a provider of information (Abrahamson, Tittle, & Cohen, 1979, p. 134). Wentling (1975) in Evaluating Occupational Education and Training Programs consider evaluation from two definitional points. One is evaluation as the process of delineating, collecting, and providing information that is useful for judging educational effectiveness. The second point is that evaluation is the determination of the worth of a thing. Evaluation includes obtaining information for use in judging the worth of a program, project, procedure, or objective of the potential utility of alternative approaches to attain specified objectives (p. 145). According to Worthen and Sanders (1973), in education there are at least three different schools of thought about how the term evaluation should be defined. The first school of thought sees evaluation as synonymous with educational measurement. This school of thought came into existence as a result of the ascendancy of the measurement movement (Ebel, 1965, Thorndike & Hagen, 1961). The second school of thought developed from school and university accreditation procedures which led to a definition of evaluation that became synonymous with professional judgment of the evaluators. This view of evaluation practices places its basis on the judgments and opinions of experts, whether or not the criteria data used to reach those judgments were clear. The third school of thought emerged during Ralph Tyler's work on the Eight Year Study of the 1930's. In his work, Tyler (1967) defines evaluation as the process of comparing performance data with clearly specified objectives. This school of thought defines evaluation as the process of comparing performance data based upon clearly specified objectives. This view has continued and is reflected in several current approaches to evaluation. It is obvious that during the latter part of the 1960's other definitions for the term evaluation emerged from the works of Stake (1967), Provus (1969), and Stufflebeam (1971). Of the definitions these writers present, the most popular definition seems to center on the notion that evaluation is the systematic investigation of the worth or merit of some object .

It should be evident from the above discussion that definitions for the term evaluation lack specificity. However, when the term is accompanied by an antecedent such as program, the term becomes more specific and directional. Program evaluation includes two key concepts "program," which is the sum total of courses or a subject area that are offered in an educational setting, and "evaluation," which is the process of deciding upon the important decision areas , selecting appropriate information, and collecting and analyzing this information in order to report to decision makers to help them choose among alternatives. Another definition of program given by Pautler (1978, p. 55) was "the pursuit of a certain specialization such as cosmetology, electronics, etc. and course is defined as one segment of the total program."

Program evaluation is the process of selecting, collecting and interpreting information for the purpose of keeping various audiences informed about the program and its progress. Usually these audiences will use the information to make the decisions that affect the program.

Evaluation Models

It is evident from the vast amount of literature on evaluation that appeared in the mid-1960's, evaluations became the focus of intense scholarly scrutiny. There were a number of evaluation specialists (Tyler, Scriven, Stake, Stufflebeam and others) who offered a variety of methodological procedures for program evaluations; e.g., the Discrepancy Model, and the Countenance Model (Stake, 1991, pp. 70-71). House (1978) classified the various approaches to evaluation into a theory that consisted of these eight models: System Analysis Model is widely used by economists and enterprise managers to evaluate program efficiency. Behavioral Objectives originated with Ralph Tyler (1949) and more recently received considerable support by Popham (1975). Among the major audiences of this approach to program evaluation are business managers and psychologists. Decision Making Model is structured by the decisions to be made. Stufflebeam (1971)is a strong advocate of this model. This evaluation model is used extensively to evaluate the policy control of a program and its effectiveness. Goal-Free Model is used to reduce the effects of bias in evaluation. An advocate of this model is Scriven (1966) who used this model to evaluate consumer choice and public utility. Art Criticism Model is widely used to evaluate a program in order to improve program standards. Eisner (1979) are leading figures who subscribe to this evaluation model. Accreditation Model is over 50 years old and is used by schools that have united cooperatively to evaluate each other. This evaluation approach has been extensively used by NSSE (1940) to evaluate educational institutions before they can be professionally recognized. This model is described in greater detail in a subsequent section of the chapter. Adversary Model is considered by House to be quasi-legal because it often takes the form of trial-by-jury when the pros and cons of a program are presented to attain resolution. Among the prominent advocators of this form of evaluation is Wolff (1968). Transaction Model concentrates on the educational processes which include the classroom, the school, and the program. In this evaluation approach, methods of investigation which rely heavily on the case study are the major methodologies that are used. Among the leading figures in transaction evaluation are Stake (1967), Smith (1955), MacDonald (1974), and Hamilton (1977).

It should be evident and obvious to the specialist in evaluation that a number of evaluation models have been omitted from the above discussion. These models were not included because they were not relevant to the research.

Evaluation models were first conceived and used by the military, later by government, business, and industry and later these models were used by educational institutions. Abrahamson, Tittle, and Cohen (1979), in discussing evaluation models and design, caution there is a basic distinction between models and theories (p. 138). To these authors, models are "judged on the basis of a continuum of usefulness. Theories are judged along a continuum of truthfulness" (p. 138).

NSSE Evaluation Model

The NSSE Program Evaluation Model was developed by the National Study of School Evaluation (NSSE) to evaluate secondary schools and secondary school programs for accreditation. This body was first organized in 1933 as the Comprehensive Study of Secondary School Standards and was responsible for developing the Initial Evaluative Criteria that were developed in 1940, and that were revised in 1950, 1966, 1969, 1978, and 1987. These revisions of the evaluative criteria involved hundreds of secondary school educators. To establish reliability and validity, these criteria were developed by many distinguished men and women as effective instruments to evaluate a school through a systematic process, to assess the effectiveness of a school, and to stimulate a school and community partnership to establish a planned program of continuous growth so that the school may become progressively better (The National Study of School Evaluation, 1987).

These Evaluative Criteria are for 18 subject areas that are offered in secondary schools. For each subject area, in order to facilitate description and judgment, these criteria are structured into these nine subsections: Major Expectations, Follow-Up to Previous Evaluations, Organization for Instruction, Description of Offerings, Components of the Instructional Program, Facilities and Equipment, Learning Climate, Evaluations, Judgments and Recommendations.

Both the Descriptive Criteria and the Evaluative Statements are judged on five-point scales (The National Study of School Evaluation, 1987).

The 1987 edition of Evaluative Criteria is based on the basic principle that a school shall be evaluated in terms of what it is striving to accomplish (its philosophy, objectives, and priorities) and according to the extent to which it is meeting the needs of the students and community it serves. The philosophy, objectives, and priorities of the school must be acceptable to a community as well as agencies responsible for educational organization.

To carry out the evaluation process using the NSSE Model, a three-step process is used to complete the evaluation of a school. The first step is a self-evaluation carried out by faculty of the individual school (subcommittee), using the Evaluative Criteria for each subject area. According to the NSSE, the self-evaluation process is an attempt to improve the quality of the school's program through the means of self-evaluation, introspection, and comprehensive examination of what is happening to students in the school environment (The National Study of School Evaluation, 1987).

To use the evaluative criteria in the evaluation process, it is necessary to have a steering committee to plan and supervise the entire self-evaluation of the school. Normally, a consultant is employed to meet with the school faculty to explain the background, policies and procedures of the evaluation process before the subcommittees begin to carry out the self-evaluation process. Typically, a steering committee includes the principal or an assistant principal and a department head for each subject area as committee members (The National Study of School Evaluation, 1987). A Self-Evaluation Committee for each subject area is struck and given the mandate to use the evaluative criteria designated for that particular subject area for its self-evaluation.

After all subcommittees have completed their respective self-evaluations, it is necessary that these committees report to the entire faculty of the school. The subcommittee self-evaluation findings are considered to be critical in order to make the study a comprehensive and systematic appraisal of the school's educational program (The National Study of School Evaluation, 1987).

In order to make the evaluation a complete process, it is recommended by NSSE that a visiting committee make an on-site visit to the school after the self-evaluation process has been completed. The second step is an evaluation by a visiting committee (steering committee). The purpose of the school visitation by the visiting committee is to validate the self-evaluation carried out by the school faculty. On-site visiting committees are comprised of subject area teachers selected from a roster of teachers maintained by NSSE. Prior to being placed on the committee, the teacher's name must be approved by the receiving school. Members of the visiting committees use the identical evaluative criteria used by the Self-Evaluation Committees. The NSSE recommends that parents and students be involved in the self-evaluation process by having them represented on all subcommittees. The third step is the school's consideration and follow-up of the findings of the evaluation. Following the on-site visit by the visiting committee, the chair of the committee submits to the superintendent of schools the final written report which suggests changes to improve the educational program (The National Study of School Evaluation, 1987).

Related Research

A review of the literature that reports the findings of educational research was conducted using electronic and physical means. The electronic data base searched was Educational Resources Information Center (ERIC) using Compact Disc Read Only Memory (CDROM). Descriptors used to search this data base between 1966 and 1993 were industrial arts, program evaluation, and secondary school. This search resulted in five matches. After studying the CDROM printout, the decision was made that none of the reported studies was related to the current research. Therefore, these five studies were not used in the content of this chapter.

A physical search was made of the standard indices used to report the findings of educational research. Among these indices were Canadian Education Index, Education Index, Canadian Index to Journals in Education, and Dissertation Abstract International. The result of this search helped to identify three master's theses and one doctoral dissertation that were related to this study. Authors of these master's theses completed the requirements for a Master's Degree at the Department of Industrial and Vocational Education, the University of Alberta. Among these researchers were Vilaiprom (1971), "An Evaluation of the Industrial Arts Program in the Thirteen Comprehensive Schools in Thailand;" Thompson (1977), "An Evaluation of the Industrial Arts Program in the Government Secondary Schools in Guyana;" and Alexander (1981), "An Evaluation of the Industrial Arts Program in the Government Schools of Antigua and Barbuda." The library research of the studies dealing with the topic of "An Evaluation of the Industrial Arts Program in Secondary Schools" through the ERIC data base between 1966-1981 revealed only one study on the data base - a doctoral dissertation entitled "The Development of Criteria for Industrial Arts in the Public Secondary Schools and its Application to South Dakota Schools." From the review of the ERIC abstract, it was found that this study was not relevant to the present investigation. In addition, the search of the ERIC data base from 1982 to September 1993 using the previous descriptors resulted in four matches. A review of the abstracts for four studies revealed that none could be used in this study.

Historically, the University of Alberta has had an undergraduate teacher education program for the preparation of industrial arts teachers since 1940. However, the master's degree program for industrial arts teachers did not begin until the 1964-65 academic year. Since that time, 257 industrial arts teachers fulfilled the requirements for the degree. An analysis of theses shelved in the Department of Adult, Career and Technology Education, previously the Department of Industrial and Vocational Education, show that three of these students elected as their theses the evaluation of the industrial arts program in their home countries.

Because of the close relationship of these three studies to the current study, each will be reported in detail in the following paragraphs.

Vilaiprom (1971)

The only evaluative study of industrial arts in Thailand was conducted by Vilaiprom in 1971. It involved the industrial arts program in 13 comprehensive schools that were part of The Comprehensive School Project. To collect data for analysis, a modified version of Section D-11, Industrial Arts Evaluative Criteria 1960 Edition, of the then National Study of Secondary School Evaluation (now the National Study of School Evaluation, NSSE) was used.

From the research findings, the following conclusions were made:

Regarding the organization of the industrial arts program, the members of the Self-Evaluation Committee were generally satisfied with this aspect of their industrial arts programs. Although satisfaction may have been inferred for the overall organization of industrial arts programs, the evaluating committees were concerned over the amount of time allocated for industrial arts courses (p. 128).

Under the nature of offerings, the evaluating committees considered that the stated objectives for the industrial arts program were being met with the program that was offered. Among the major areas of concern expressed by the evaluating committees were the following: the meaningfulness of the content of courses offered in the industrial arts program, the courses of study for power mechanics, metalwork, and drafting lacked "hands-on" activities and were too theory oriented, and that the information and experiences that students were exposed to in developing concepts related to labor-management problems and environmental control of modern industry were considered deficient (pp. 129-130).

Physical facilities was an area of greatest dissatisfaction expressed by the evaluating committees. These committees indicated that physical facilities were deficient in three broad areas: the physical layout of the shops, the utilities provided in the shops, and the equipment that was provided. As for physical lay out, the evaluating committees expressed concern that little consideration was given to shop planning, particularly in the manner in which equipment was placed and used by students. In the Metalwork area space was not provided to accommodate the storage of large pieces of equipment. Concerning the utilities provided to make these facilities more functional, members of the Self-Evaluation Committees found there was an inadequate number of drinking fountains and washing facilities, as well as limited means of exhausting heat, fumes, gases, and dust from the areas where contaminated air could be injurious to the student's health (pp. 130-131). The evaluating committees also expressed concern that the height and size of some of the equipment provided in the shop were not suitable for students, the frequent burnout of equipment as a result of excessive heat, and the unavailability of spare parts for machine tools (pp. 131-132).

The evaluating committees were of the opinion that the direction of learning was not meeting the stated objectives when measured by the criteria of the evaluative instrument. For seven of the 12 statements used to evaluate the instructional staff, they were rated above average or excellent. The evaluation committees, however, did identify several deficiencies concerning instructional staff which indicated they were not keeping abreast of the professional literature and research in the field of education. They were not qualified in first aid and safety procedures to be followed in case of student injury; they did not understand counseling procedures and guidance services; and that newly appointed industrial arts teachers lacked both industrial experiences and salable skills (pp. 132-133).

Instructional activities were found to be deficient in class activities and supporting instructional hardware.

> Under class activities it was found that students did not have the opportunity to conduct test and experiments directed at science and industry; that teachers did not make use of the community resources which were available to them; that industrial arts students did not participate in a shop safety program; and that students both boys and girls did not learn about the basic tools and machines of an industrial technological society. (Vilaiprom, 1971, p. 133).

Results of this research show that industrial arts teachers in most of the comprehensive schools were seriously in need of all types of instructional materials. Among these instructional materials were up-to-date information resource material, suitable curriculum guides for the teacher, instructional aids, and instructional technology hardware (pp. 134-135).

Seven of the 13 evaluating committees questioned the validity and the reliability of the methods used by industrial arts teachers in these schools to evaluate students. It was recommended by these committees that more accurate and more comprehensive instruments be used by the industrial arts teachers to evaluate leadership development, responsibility, problem solving ability, and attitudes toward safety (p. 135).

Neither did these students acquire the ability to select, care for, and use industrial products intelligently, nor did they appreciate good design and construction. The evaluating committees in the 13 schools found that industrial arts students in these schools did not develop an understanding of the properties and uses of raw materials that were used in the industrial arts shop (pp. 135-136).

A major weakness of the Vilaiprom study was that he failed to back translate the Evaluative Criteria from Thai to English to check the accuracy of the initial translation. Another weakness of this study was that the Self-Evaluation Committee structured in each school did not include a student representative.

Thompson (1977)

Thompson completed the requirement for a Master's degree at the University of Alberta and conducted an evaluation of the industrial arts program in the government secondary schools in Guyana. To collect data, Thompson (1977) used a modified version of Section 4-10, Industrial Arts of the Evaluative Criteria, fourth edition, the National Study of Secondary Schools Evaluation. From the findings of that research it can be concluded that industrial arts programs in Guyana needed improvement in these areas: physical facilities, instructional materials, financial support, direction of industrial arts, and the outcomes of industrial arts.

Thompson's study showed that the organization of the industrial arts program in Guyana was considered satisfactory. There were, however, some limitations regarding the organization of the industrial arts program and these included the size of an industrial arts class, the length of class period in industrial arts, and the scope of the industrial arts program regarding the course offerings.

The findings of Thompson's study also showed the content of industrial arts programs did not provide for significant group activities and projects that involved problem solving situations. In addition, it was found that the industrial arts program did not provide students with exploratory experiences with a variety of tools, materials and industrial processes.

Industrial arts facilities in Guyana were found to be insufficient both in quantity and variety of tools, instruments and equipment provided for industrial arts shops. Furthermore, the health and safety measure in the industrial arts shops were not meeting the acceptable standards for a school shop.

Concerning the area of direction of learning, it was found that industrial arts teachers in participating schools were not meeting the required qualification. In addition, instructional activities neither provided for individual differences nor met the needs of the students. The findings of Thompson's study also indicated that there was an urgent need for more textbooks, reference materials, and instructional resources in the industrial arts area. Finally, regarding the area of direction of learning, the findings revealed methods of evaluation were inappropriate.

The last area of the industrial arts program in Guyana that needed improvement was the outcomes of industrial arts program. It was found that the content of the industrial arts courses offered was neither helping the students to understand and appreciate labor management problems, nor developing and discovering any interest, aptitude, and abilities of the students in industrial concepts. In addition, it was found that students did not develop any appreciation for good design or construction and craftsmanship. Overall, the outcomes of the industrial arts program were found to be unsatisfactory.

Alexander (1981)

To complete the requirement for a master's degree at the University of Alberta, Alexander (1981) conducted a research entitled "An Evaluation of the Industrial Arts Program in the Government Schools of Antigua and Barbuda."

The findings from Alexander's study concluded that the organization of industrial arts as measured by the instrument was undesirable to those who participated in the research. This conclusion was supported by the general evaluation section from General Evaluations. Organization of Industrial Arts had two of three criteria that were rated as undesirable. Major concerns of those involved in the research centered on the organization of industrial arts which included inadequate funding of the program; the narrow scope of the program, which needed to be broadened to include more areas; a grossly inadequate space for instruction which resulted in overcrowding; and class sizes that were too large. Courses offered did not challenge the interests, abilities, and developmental needs of the students. Participants were dissatisfied with the physical facilities in three broad areas: the design and layout of the shops, the utilities provide in the shops, and the tools and equipment that were provided. Both instructional activities and instructional material were favorably rated as were the methods of evaluation. The participants, through their evaluation, expressed concern over the inadequate inspection of health, fire, and safety of the industrial arts facilities. Despite overall satisfaction, there were two serious limitations identified: the students had few leisure time activities, and they did not understand or know about the importance of raw materials.

SUMMARY

The present Thai educational system has been influenced and altered by many forces over the past seven centuries. The Thai educational system in the past was similar to that of the monastic and cathedral schools of Medieval Europe since education was then offered in Buddhist temples. Skills training in the past was the responsibility of a family unit, and only children of the upper class were expected to receive any kind of general education.

The history of education in Thailand is divided into three periods: the Traditional Period (1257-1867); the Educational Expansion Period (1868-1931); and the Present Period (1932 to the present time).

During the Traditional Period (1257-1867), the first Thai alphabet was developed in 1283 by King Ram Khamhaeng the Great of Sukhothai Period (1279-1300). Although the original Thai alphabet has undergone extensive change during the past seven centuries, much of the original alphabet is still in use. Education throughout the Traditional Period was confined to the Buddhist temples. It was in this period that the westerners came into Thailand for the first time bringing with them many skills and new technologies which helped reform Thai education.

During the Educational Expansion Period (1868-1931), the first public school was opened in the country by King Chulalongkorn (Rama V) of Ratanakosin Period to train boys so they might become literate and well-mannered men of society. The Ministry of Education was first established in 1887 as the Department of Education and later was elevated to ministry status in 1892. The milestone for public education in Thailand came in 1921 when the Compulsory Education Act was passed, which required all children, boys and girls between ages seven to 14 to attend school. In this period, the first university of the country, Chulalongkorn was founded.

The Present Period (1932 to the present time), marked a new era for education in Thailand when the revolutionary government asserted an effort to improve education. During this period, several National Schemes of Education were promulgated. The first National Education Scheme was passed in 1932 in which a 4-4-4 plan for the structure of education was implemented. The current National Education Scheme implemented in 1977 has a 6-3-3-4 organizational pattern in which there are six years of compulsory education, Grades 1-6. The current National Education Scheme of 1977 sets four major sequential levels of formal education as pre-primary, primary, secondary, and post-secondary education.

According to the 1977 National Education Scheme, pre-primary education encourages the harmonious physical, intellectual, emotional and social development of a child prior to formal education at the primary education level. Primary education helps children gain permanent literacy in reading and arithmetic and to acquire sufficient basic skills and knowledge that will enable them to earn a living and become law-abiding and socially-conscious citizens under the constitutional monarchy. Secondary education equips the learner with adequate knowledge, experience and skills required for occupational employment, or for the learner to further his or her studies based on interests and aptitude. Post-secondary education aims at training the learner for high-level vocational education specializing in a certain skill in line with the labor market.

Industrial arts was first offered in Thailand in 1951 at a Pilot Project School in Chachoengsoa Province, Thailand under UNESCO's sponsorship. The first permanent comprehensive school in Thailand, Suranari Withaya School was established in 1960 at Nakorn Rajasima. Three years later in 1963, the second comprehensive school of the country was established at the same city. The success of the first two comprehensive schools of the country made a significant contribution to Thai education because in these schools the dropout rate decreased steadily and the attitudes toward vocational education became more positive. In 1965, the Committee for the Comprehensive Secondary School recommended that the concept of the comprehensive school be expanded upon using as a model the first two comprehensive schools. Later the expansion of comprehensive schools became national policy. However, the government found it was too expensive to maintain the comprehensive schools. Thus, these reverted to their original status five years after external funding from CIDA terminated.

A review of the related research on evaluative studies of an industrial arts program of these researchers: Vilaiprom (1971), Thompson (1977), and Alexander (1981), showed the industrial arts programs in these countries needed improvement in a number of areas. Those areas were organization of instruction, course offerings, facilities, direction of learning, outcomes of instruction, and special characteristic of industrial arts program. In Vilaiprom's (1971) study, in addition to failing to back translate the Evaluative Criteria from Thai to English to check the accuracy of the initial translation, another limitation in the research design was not having student participation in the study. It is generally accepted that, as the products of an instructional program, students have as much to contribute in any evaluative procedure as administrators, teachers, and parents. Both Thompson (1977) and Alexander (1981) must have realized this limitation and thus both researchers decided to include a student representative in the Self-Evaluation Committees established in each of the sample schools of their studies. However, in Thompson's study only one student participated in the Self-Evaluation Committee, while Alexander's study included two student participants in the Self-Evaluation Committee in each of participating schools. This study included two student participants in the Self-Evaluation Committee in every participating school.

A review of the related literature concerning school program evaluation suggested that evaluation of a school program can be achieved by using self-evaluation committees comprised of school faculty and students. In order to carry out an evaluation of the industrial arts program in secondary schools in Thailand, the researcher decided to use the process of self-evaluation to collect the relevant data by using Section 4-16, Technology Education (Industrial Arts) of the Evaluative Criteria, Sixth Edition, 1987, developed by the National Study of School Evaluation.

CHAPTER III

METHODOLOGY

Introduction

This chapter presents the procedures that were used by the researcher with Self-Evaluation Committees to collect data for analysis. The content of this chapter is divided into the following headings: Research Components, Research Samples, Self-Evaluation Committees, Data Collection, and Research Procedures.

Research Components

A major research component that had to be considered before the research could be started involved ethical procedures that interfaced with two discrete but supportive agencies. These agencies were the NSSE (National Study of School Evaluation) and the University of Alberta, Department of Secondary Education Ethics Review Committee.

Ethical Considerations (NSSE)

To secure copyright release from the NSSE, a letter was sent to the Executive Director of that agency explaining the purpose of the study and requesting permission for the researcher to reproduce Section 4-16 as the instrument for the study. The requested permission was readily granted providing the researcher would meet the following conditions:

> 1. The National Study of School Evaluation will hold the copyright to the translated version of section 4-16.
>
> 2. The researcher cannot sell or provide the translated section to any other person(s).

> 3. The researcher provide the National Study of School Evaluation with 4 copies of the translated section to secure the copyright. (Personal Correspondence, 1992)

A follow-up letter to the Executive Director, NSSE, expressed thanks for being granted permission to use Section 4-16. This correspondence explicitly stated that the three conditions would be fulfilled when the investigation was completed. (Copies of all correspondence to obtain copyright release comprise Appendix B.)

Ethical Consideration (Department)

To determine if the research design and the research instrument met the ethical guidelines for conducting research established by the University, a copy of the research design and a copy of both the English version and the Thai translation of Section 4-16 of the *Evaluative Criteria* were submitted to the Department of Secondary Education Ethics Review Committee for its reaction. The committee gave an affirmative reply which indicated that the researcher could proceed with the research.

Instrumentation

The instrument used to collect data by the Self-Evaluation Committees was the Thai version of Section 4-16, *Technology Education (Industrial Arts) Evaluative Criteria*, 1987, of the National Study of School Evaluation (NSSE) (See Appendix A). There were two major reasons why the researcher selected these NSSE criteria for this investigation. The first major reason was the availability of these criteria and the fact that they would require minimal revision on the part of the researcher. The second major reason for using these NSSE criteria was that they had been carefully critiqued and revised several times by the NSSE and they were used for school evaluations in tens of thousands of schools throughout the world, thereby establishing reliability and content face validity (the National Study of School Evaluation, 1987). Accordingly, while these criteria have seen wide use to evaluate industrial arts programs in individual schools of school districts throughout the world, they have not been used on a nationwide basis in any of these countries.

When the evaluative criteria were revised by NSSE in 1987, the term "Technology Education" was substituted throughout these criteria for the term "Industrial Arts." The latter term is used in Thailand for this subject area. As a consequence, this necessitated that the evaluative criteria be revised to fit education in Thailand. This was accomplished by substituting the term “Industrial Arts” in statements where the term “Technology Education” appeared. This substitution was made because industrial arts teachers in Thailand are more familiar with the term "industrial arts" than they are with the term "technology education," which is a term used for this subject area in the United States.

Since the industrial arts program in secondary schools in Thailand is not as fully developed as Industrial Arts/Technology Education programs in North America, certain words, phrases, and statements of the evaluative criteria were either altered or deleted. These changes were made to negate misinterpretation by members of the Self-Evaluation Committees. These changes were made by the researcher who is fluent in Thai. Another change that was made was to retitle the Sub-Section "Judgments and Recommendations" to "Evaluation Summary and Suggestions." This retitling was made because the researcher had reservations that the Thai participants may have difficulty with the phrase "Judgments and Recommendations" and its intended usage.

The Evaluative Criteria with nine categories in its original form were reduced to seven categories to suit the Thai educational system. The two categories that were eliminated were "Follow-Up to Previous Evaluations" and "Evaluations". The rationale for eliminating the former category was that no previous evaluation of industrial arts as a subject area had been conducted on a national scale in Thailand. As a consequence it was impossible to compare data or to make recommendations based on previous evaluations. The latter category was not used as part of the research instrument because the open ended statements would yield a wide variety of data that would be difficult for the researcher to analyze and to categorize making it nearly impossible to establish consensus.

These seven categories used in the research were:

1. Major Expectations
2. Organization for Instruction
3. Description of Offerings
4. Components of the Instructional Program:

    (a) Faculty
    (b) Instructional Activities
    (c) Materials and Media; and
    (d) Student Assessment and Program Evaluation

5. Facilities and Equipment
6. Learning Climate
7. Evaluation Summary and Suggestions

Two of the nine original categories, "Components of the Instructional Program" with its sub-sets Faculty, and Student Assessment and Program Evaluation as well as "Learning Climate" had a section that asked for supplementary data. The supplementary data sub-set for Faculty was retitled Additional Information and the original three questions were reduced to two. The one question was omitted because it asked for information on professional memberships held by industrial arts teachers. This question was considered redundant because in Thailand there are no professional organizations for industrial arts teachers. The supplementary data section for the other sub-set and section were removed from the Thai version. The reason for eliminating the supplementary data sub-set for Student Assessment and Program Evaluation was that the two statements presented were not detailed in what they asked. The supplementary data section for Learning Climate was removed from the revised instrument because no prior school climate survey to determine stakeholder satisfaction with industrial arts had been conducted by the departments of participating schools.

With the exception of "Major Expectations" and "Judgments and Recommendations" categories there were 148 descriptive criteria statements for the other five categories. In the Thai version of the evaluative criteria the number of statements was reduced to 185 from 197. This was accomplished by deleting all descriptive criteria statements that dealt with industrial arts for special needs students.

Each of the above categories included descriptive criteria statements, evaluation statements, and a comment section. For both statements, a five point rating scale was included - five representing the upper extreme of the continuum or excellent and one representing the lower extreme or missing but needed. If members of the Self-Evaluation Committee felt the statement was neither desirable nor applicable, it could check the non-applicable column.

The comment section was made available to members of the Self-Evaluation Committees who wanted to make relevant comments directed at either the strengths or the deficiencies of the schools' industrial arts program and how the identified deficiencies might be negated or improved so that the program could better meet its established goals.

Back Translation

The English version of Section 4-16 was translated by the researcher into Thai (See Appendix D and then back translated from Thai into English following this procedure. The Thai translation was placed in the hands of two Thai industrial arts teachers who teach this subject area in secondary schools in Alberta. These industrial arts teachers were selected to participate in this phase of the research because of their expertise as industrial arts teachers, and because they are proficient in both English and Thai. The purpose of the back translation was to determine the accuracy of the Thai translation.

The back translators had the responsibility for determining if the translation was accurate and understandable, if the translated statements were properly formulated to fully communicate the intent of the statement to the participants, and whether revisions were necessary in the phrasing of each statement before it was piloted and subsequently used on-site by the Self-Evaluation Committees.

Following an analysis of the back translation of the instrument and comments made by the reviewers, it was revised by the researcher and later piloted in a large-size secondary school in Bangkok.

Correspondence was sent to the Director General, Department of General Education, Ministry of Education, Bangkok, Thailand requesting permission to do the following: to conduct the study in selected secondary schools, to pilot test the instrument in a large-size secondary school in Bangkok; to have appointed four persons who would coordinate the pilot study; and to have use of the FAX machine for transmittal of data. The Director General for Education granted permission for what was requested. The reader is asked to turn to Appendix C for copies of these letters.

Pilot Study

A large-size secondary school in Bangkok was selected to be the sample school for the pilot study for these reasons: (1) because of its availability to the researcher, (2) because of the cooperation of personnel of the Department of General Education to administer the evaluative criteria, and (3) because the principal of the school was familiar with the research and its design. To conduct the pilot study, two Fine Arts coordinators from the Department of General Education, Ministry of Education, who were knowledgeable about the study were appointed to work with the Pilot Study Self-Evaluation Committee which had the same structure as a Self-Evaluation Committee for a large-size school: the school principal, the industrial arts department head, two industrial arts teachers, and two industrial arts program students. The latter had to meet the selection criteria established for selecting students. It was the responsibility of the coordinators to explain the purpose of the research and to give instruction about how the criteria were to be completed to the committee members.

The pilot study was conducted to determine the accuracy of the Thai translation, to determine if there was ambiguity in any of the statements, and to determine if any revisions were necessary. One of the recommendations made by the Pilot Study Self-Evaluation Committee was that the instrument be modified by including additional statements that would be directed toward the student population. The researcher, following a discussion with the supervisor, rejected this recommendation because it was felt that statement specificity would be added for the student group and not the other groups-thus, making the instrument less generic and possibly affecting its reliability.

From the recommendations made by the Pilot Study Self-Evaluation Committee, the instrument was revised before it was used by the 34 Self-Evaluation Committees.

Analysis of information and data collected with the pilot study showed that these data could be analyzed and research findings generated.

Research Sample

The research sample was taken from the population of school principals, industrial arts department heads, industrial arts teachers, and industrial arts students from the selected 34 secondary schools. The sample of secondary school principals from the principal population totaled 34. Among this cohort were 12 principals from large-size secondary schools or provincial schools with 21 or more classrooms; 10 principals from medium-size secondary schools or district schools that have from 10 to 20 classrooms; and 12 principals from small-size secondary schools or sub-district schools where the number of classrooms ranged from one to nine.

The sample of industrial arts department heads consisted of 34, 12 each from secondary schools classified as either large-or small-size, and 10 from medium size schools. Department heads are appointed by the Department of General Education to this administrative position on the basis of working experience and academic qualifications. It should be pointed out that in some instances, particularly in small-size schools, the department head and the industrial arts teacher were the same person.

The sample of industrial arts teachers consisted of two industrial arts teachers from each of the large- and the medium-size schools, totaling 44. The number of industrial arts teachers who practice in large- and medium-size schools is generally three or more teachers. From that group of teachers, two were selected from each size of school using a random sampling procedure. No criteria were established for selecting these teachers; this was done to avoid any form of bias that might contaminate the sample. In the 12 small-size secondary schools, the industrial arts teacher who acted as both a department head and a member of the teaching staff was selected to be a member of the self evaluation committee. This brought the teacher cohort to 56. Of this number, 44 were from large- and medium-size schools and 12 were from small-size schools.

Regardless of the size of the school, two industrial arts program students were selected from each of the 34 participating schools for a total of 68 students.

The following selection criteria were established and used by the school principal to select students from large-size schools and medium-size schools for eligibility for committee membership:

A Grade 12 student who has successfully completed industrial arts courses at the Grades 10 and 11 level, is enrolled at the Grade 12 level for industrial arts, and has attained a grade point average of 3.0 or better in all industrial arts courses.

Students in small-size secondary schools had to meet these selection criteria to be eligible to serve as a member of a Self-Evaluation Committee:

A Grade 9 student who has successfully completed industrial arts courses in Grades 7 and 8, and has attained a grade point averaged of 3.0 or better in all industrial arts courses.

It was left to the professional judgment of the school principal whether or not the students selected for committee membership fulfilled the selection criteria.

Data in Table 1 graphically represent the composition of the self evaluation committee for each size of school.

Data Source

Self-Evaluation Committees in the 34 secondary schools were the major source of data for analysis. These committees used the Thai version of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, 1987 to evaluate the industrial arts program in their schools.

These data included ratings given by these committees to both the descriptive criteria, the evaluation statements, and written comments provided by members of each of the Self-Evaluation Committees.

Table 1

Composition of Evaluation Committee: School Size

School Size	Committee Members			
	P	DH	T	S
Large: more than 21 classrooms	1	1	2	2
Medium: 10 to 20 classrooms	1	1	2	2
Small: 1 to 9 classrooms	1	-	1	2

P = PRINCIPAL
DH = DEPARTMENT HEAD
T = TEACHER
S = STUDENT

Self-Evaluation Committees

For educational purposes in Thailand, the Ministry of Education has divided the country into 12 educational regions. In total, there are 1776 secondary schools located in the 12 educational regions. In each region, there are both urban and rural areas in which three different size secondary schools have been established to serve the population in that particular region. These schools were established on population density and are classified according to number of classrooms as large-, medium-, and small-size schools. A large-size school is a provincial school with at least 21 classrooms. A school with 10 to 20 classrooms is considered to be a medium-sized school and is designated as a district school. A small-size school has nine or fewer classrooms and is categorized as a sub-district school. Regardless of its size, a school is administered by a principal who is responsible for the quality of instruction and carrying out the policies and regulations established and promulgated by the Ministry of Education. In each of the 34 secondary schools, a Self-Evaluation Committee was formed. Regardless of the size of the school, both the school principal and the industrial arts department head were designated as committee members. Other members of the committee included two industrial arts teachers and two industrial arts program students in large- and medium-size schools.

For small-size schools, only one industrial arts teacher and two industrial arts program students were selected as committee members. To be eligible as a committee member, student members had to meet the selection criteria that were established for their selection.

Data Collection

The instrument used to collect data for analysis was the Thai version of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, 6th Edition, 1987.

Data Analysis

Data collected with the research instrument were analyzed and placed into tabular form using frequencies and percentages. From analysis of these data, findings, conclusions, and recommendations, were made.

Research Procedures

The following research procedures were used to bring this investigation to its conclusion.

From a review of both the literature and research that has been conducted on program evaluation, the decision was made by the researcher to use the 6th Edition of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, of the National Study of School Evaluation. Among the researchers who have previously used other revisions of these evaluative criteria for program evaluation were Vilaiprom (1971), Aird (1972), Thompson (1978), and Alexander (1981).

To secure copyright release to use Section 4-16 in the research, correspondence was initiated with the Executive Director of the National Study of School Evaluation. A copy of this correspondence can be found in Appendix B of this report. The requested permission was readily granted. When that permission was given three provisos were imposed upon the researcher. These three conditions are listed in a previous section of this chapter entitled "Ethical Considerations." In subsequent correspondence with the Executive Director, the researcher agreed to meet the conditions stipulated.

After permission was granted to use Section 4-16, it was translated into Thai by the researcher who is bilingual and fluent in both Thai and English. Two major modifications were made to these criteria. First was to replace the term "Technology Education" with the term "Industrial Arts" in all descriptive-criteria and evaluation statements. The second modification that was made was to reduce the nine categories of the criteria to seven by eliminating the categories of "Follow-Up to Previous Evaluations" and "Evaluations." Other modifications that were made to these criteria are fully described in the "Instrumentation" Section of this chapter.

The Thai translation was back translated into English by two industrial arts teachers who taught in Alberta and are bilingual in both Thai and English. This procedure was followed to make certain that the significance and meaningfulness of the terms used with the criteria were not lost in the translation. A major comment of these reviewers was that some of the terms used would have to be modified to make them understandable with those involved in the Thai educational system. It was also pointed out that the directions provided to participants would have to be made more explicit. These recommendations were incorporated into the revised instrument that was used in the pilot study school.

Near the end of 1992, two fine arts supervisors from the Department of General Education, Ministry of Education, Bangkok, Thailand, made a visit to the campus of the University of Alberta. While these visitors were on campus, the researcher served as their host and had the opportunity to discuss with them the research design and the role that the Department of General Education and its personnel would have in the pilot study and major data collection phase of the research. From this discussion, it was agreed that these supervisors, upon their return to Thailand would take with them a letter addressed to the Director General, Department of General Education, Ministry of Education and the Thai version of Section 4-16. The letter provided a brief overview of the research, a request for permission to conduct both the pilot study and the major study in the secondary schools in the country, and to appoint the two fine arts supervisors and two additional people as coordinators for the pilot study. How these schools for data collection were selected is fully detailed in that section of this chapter under "Research Sample." A copy of this letter and its English translation can be found in Appendix C.

To test the accuracy of the Thai version of Section 4-16, a pilot study was conducted by the two Fine Arts coordinators in a large-size secondary school in Bangkok. The pilot study was conducted under the direction of the two coordinators appointed by the Director General. This school was not involved in the major study. As a result of the pilot study and an analysis of the comments made by the Self-Evaluation Committee for this school, the following decisions were made: to complete a readability check of the criteria statements with grade 9 industrial arts students and to retain the composition of the self-evaluating committee. The former decision was made because only grade 12 industrial arts students served on the Self-Evaluation Committee for the pilot study.

For the readability check two grade 9 industrial arts program students in a large-size secondary school in Bangkok were used. These students were not part of the research population. An analysis of the recommendations made by these students indicated that some terms used in both the descriptive criteria and in the evaluative statements were difficult for them to comprehend or understand. Examples of problematic terms were as follows: personnel, transportation, production, construction, and communication. For these and other technical terms more common terms that would be familiar to an average Grade 9 student in Thailand, who might be involved in the study were substituted.

When correspondence was initiated with the Director General, three request were made. The first of these requests was to obtain permission to conduct the research of industrial art programs in selected secondary schools in the 12 educational regions. As previously indicated this request and the remaining two were readily granted.

In accordance with the timeline established to guide the study, the researcher returned to Thailand between May 1993 and August 1993 for the following reasons:

1.- To complete the readability check of the research instrument and to make the necessary changes;

2.- To select the 34 secondary schools in the 12 educational regions that would become the sample schools;

3.- To discuss with the Director General the contribution that the Department of General Education would make to the research (i.e., transportation, per diem costs, use of support personnel) and the procedures that would be followed by the researcher in conducting the study; and

4.- To complete the data collection phase of the research.

The role of the researcher during the site visits to the schools was to form Self-Evaluation Committees, to explain the evaluative criteria to the committee members, and to have the members of these committees complete the evaluative criteria. To assure the members of each Self-Evaluation

Committee anonymity and confidentiality, they were informed that research ethics would be strictly followed.

However, during the data collection phase of the investigation, there were incidents that occurred in Thailand that prevented the researcher from adhering to the original timeline. In the four southern-most provinces of the country, Muslim separatists threatened the stability of the region by burning down 34 schools in the rural areas. As a consequence of these actions, schools in these provinces had to be closed for a month until the situation normalized. In addition, the data collection phase was conducted during the rainy season; consequently, some of the eastern provinces of the country were flooded, which made sample schools in these provinces inaccessible. Both of these incidents delayed the data collection phase by a month.

The data collected with the instrument will be analyzed in the next chapter. From this analysis, research findings, conclusions, recommendation, and observations are made in the fifth chapter.

CHAPTER IV

ANALYSIS OF DATA

Introduction

In Chapter III, the methodology used to collect the data for this study was discussed. In this chapter, the data that were collected with the Thai version of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, will be presented and analyzed. This analysis will coincide following the sequential structure of the research instrument beginning with "Major Expectations" and ending with "Evaluation Summary and Suggestions."

The National Study of School Evaluation (NSSE) is very prescriptive in the procedures it recommends to conduct a school evaluation for accreditation. In conducting a school evaluation, it is recommended by the NSSE that a two committee structure be used – a self-evaluation committee and an on-site visiting committee. A school self-evaluation committee is comprised of the professional teaching personnel of the school who complete a self-evaluation using the criteria developed by NSSE for each subject area. The on-site visiting committee consists of a number of sub-committees, one for each subject area of the curricula of the school being evaluated. Subject area specialists to these committees are nominated from member schools of NSSE and approved by the administrative personnel of the school being evaluated.

It is incumbent upon these committees that they use the evaluative criteria designed by NSSE to evaluate each subject area of the curricula.

The concept of the on-site visiting committee was not used in this study for these reasons: (1) This research was not conducted for the purpose of school accreditation which is non-existent in Thailand; (2) Thailand does not have an organization comparable to NSSE to conduct evaluations of schools for the purposes of school accreditation; (3) the Ministry of Education makes no attempt to evaluate the subject areas that comprise the curricula of the secondary schools; (4) there is no office or department within the Ministry of Education that maintains a pool of unbiased experts that could be drawn upon to conduct school evaluations; and (5) the expense of conducting these evaluations is considered prohibitive by the Government of Thailand.

In this study, 34 Self-Evaluation Committees had the responsibility for conducting an evaluation of the industrial arts program in their schools using the Thai version of the NSSE evaluative criteria for industrial arts.

Of the seven sections of the research instrument two sections, "Major Expectations" and "Evaluation Summary and Suggestions," included a number of open ended statements for which participants were required to provide a written response. For the remaining five sections, members of the

Self-Evaluation Committees were required to make a judgment using the following rating scale:

5 Excellent
4 Very Good
3 Moderate or enough (can be improved)
2 Insufficient, (should be improved urgently)
1 There is none, but there is a need (demand)
N Unnecessary, inappropriate, did not correspond to the need

If the evaluators believed a criterion was unnecessary, innappropriate or did not correspond to the need of industrial arts program in their schools they were instructed to place a check mark in the "N" column.

For the purpose of analyzing data a frequency and a percentage for each criterion rated by a sub-population was established. These frequencies and percentages were then placed into one of three categories "High", "Adequate" or "Low" that were established by the researcher. Criterion rated either "5" or "4" by evaluators with a combined percentage that ranged between 75 and 100% was placed in the "High" category. Criteria placed in this category were considered meeting the standards for a program that would receive accreditation. Criterion rated "3" by any sub-population that ranged between 25 to 74% was placed in the "Adequate" category. "Adequate" criteria were those that did not meet the standards for program accreditation. For these criteria to meet these standards it is imperative that they be scrutinized and reviewed by the Director General and his super-ordinates and sub-ordinates and changes immediately implemented to modify the philosophical base for industrial arts, its objectives, and its learning activities to reflect future technologies and technological change. Criterion that were rated either "2" or "1" by committee members with a combined percentage that ranged from 0 to 24% were placed in the "Low" category. These criteria were those that were considered to be detrimental to the industrial arts program and required the immediate attention of both the Minister of Education and the Director General to prevent that program from becoming redundant and irrelevant leading to its obsolescence. Any criteria that were marked "N", were considered to be not applicable to the school's industrial arts program: these criteria were eliminated from the study and the analysis of its data. Both the frequencies and percentages, as well as categories for statements in the five sections of the evaluative criteria were assembled into tables. Following each table is an analysis of its data. Tables and their analyses in turn are followed by suggestions that participants made relative to that section of the Evaluation Criteria.

In presenting the data found in the table for each sub-section for the Evaluative Criteria, the following procedure is used: title of the table head is the same as the title of the subsection that appears on the Evaluative Criteria. The numbering for each statement in each table is identical to the number for the statement as it appears on the research instrument. A letter identifies the population that rated the statement from "5 to 1." This letter is followed by a number which represents the number of individuals from the sub-population rating that criterion. The second number, in the alpha numeric descriptor, represents the percentage of the sub-population who rated the criterion. For example, from Table 2, Participants Ratings: Organization For Instruction, statement 1 Current rationale developed, is followed by the alpha numeric designator; P 3 25. The letter P identifies the Principal sub-population with an "N" of 12, 3 identifies that three of the 12 principals rated statement "1" a "5", excellent, 3/12 represents 25% of the Principal group, hence, P 3 25.

Following the analysis of data for each section, the suggestions made by participants from participating schools are categorized and presented.

Major Expectations

These expectations are those that are expressed as beliefs which provide direction to the activities of school personnel and its organization. "Major expectations communicate the substance and anticipated outcomes of school programs. Expectations become the most powerful standards for quality in a school" (NSSE, 1987, p. 361).

An analysis of the responses to the four statements for this portion of the instrument follows. It becomes evident from this analysis that not all of the participants from the four groups responded to these four questions. However, the responses from the principal group, the department head group, the industrial arts teacher group, and the industrial arts student group can be clustered under certain themes.

The first statement asked participants to "Indicate the extent to which the expectations for the industrial arts program are consistent with", The school and community characteristics.

It is evident that the location of the school (be it urban, exurban, or rural) and the community characteristics predetermine the character of the school, its programs, and the programs in which the students register. In communities classified sociologically as lower class which were generally located in urban and rural areas where low income families predominate, the majority of industrial arts students were enrolled in that program to develop transferable skills that could be used in their work-life or at a technical institute. The majority of parents in these communities lack the financial resources to send their children onto higher learning. In these communities there is no stigma attached to industrial arts, because the parents see it as a passage to a better life. The program was serving the needs of the students in these communities. The same comments were made by participants from schools in agricultural areas.

In schools located in areas sociologically classified as middle or upper class, students were directed by their parents to take the academic program and to avoid taking the industrial arts program. These parents wanted their children to achieve high marks in the academic program. This would enable these students to meet the admission requirements for college or university which in turn increased their social mobility. The attitude of these parents was "industrial arts is good for other people's children but not for mine." This type of attitude cast a negative stigma over this subject area.

In some communities industrial arts was used to urgently meet the manpower needs of technology, industry, and commerce. In centers with a heavy industrial base the schools received support from industry and offered industrial arts as a quasi-form of vocational education.

Similar to other nations of the world, the technologies and technological changes that are taking place in Thailand are growing at an exponential rate. Either the technologies nor the rate of change is reflected in either the curriculum or the learning activities for the industrial arts program. The curriculum that is in-place is over two decades old. Many of the participants indicated that a course in automotives would be of greatest advantage to the student, industry, and the community – particularly in the rural areas

Regardless of the educational region in which the school was located it was evident by the comments made by participants that the content for the industrial arts program has lagged behind the evolving technologies and the technological development taking place in industry and science. This could be the result of financial constraints of the government, the lack of educational foresight on the part of educational planners, or the complacency of industrial arts supervisors of the Department of General Education to be satisfied with the Status Quo and to be reticent to lobby for program change with the proper authorities.

1. The philosophy and goals of the total school program

It was the perception of participants that the industrial arts program lacked a written philosophical statement from which the goals of the program could be formulated, as a result of this oversight these goals were rather nebulous. In a number of schools it was evident that neither a philosophical statement nor a vision statement for the school had been prepared by the publics of that school. Such a statement would have clarified in the minds of educationalist the differences between Vocational Education and Industrial Arts.

Comments made by those involved in the investigation indicate there was confusion among supervisors, school administrators, teachers, and students: "what is vocational education" and "what is industrial arts?" The major goal for vocational education in any industrialized nation is occupational or career preparation while the goal of industrial arts is general education with skill development at the use level of skill. Officials at the Ministry of

Education have a tendency to perpetuate this confusion when they cross-pollinate these two discrete programs. This weakens both programs. These officials need to learn that without a strong vocational education program Thailand will remain a third world nation instead of developing into an evolving industrial third world nation.

2. Indicate the effect of the commitment to these expectations

Those involved with providing industrial arts education to pupils in the 34 participating schools (both school administrators, and teachers), regardless of school size, are committed to providing the pupils in these schools with quality education. This is being accomplished with a curriculum that is obsolete and with learning activities and equipment that are equally obsolete both of which have been taken from the industrial model.

All indications are that the industrial arts teachers of the study would make the commitment to make a paradigm shift to a technology model from the industrial model providing they had adequate and proper leadership and financing from the Department of General Education. Without both of these ingredients the industrial arts program will remain stagnant and never achieve any of its projected expectations for a society that is becoming technologically based.

Industrial arts in some schools was seen as an appropriate way for students: to develop limited hands-on skills which they could use after leaving school to seek employment; to serve as a guidance function by responding to the individual differences of students to assist them with their career planning; and to prepare lower secondary education students for further education in either vocational or technical education.

In schools that had a high student population from the middle class and up on the social scale the expectations of the industrial art program were not being realistically perceived because of educational apartheid – the negative attitude of parents and teachers toward this subject area. Administrators in the schools were constantly fighting obstacles in order to overcome this attitude and achieve the expectations established for the industrial arts program.

Although these expectations were being met in the majority of the schools it was evident by the comments made that the curriculum content for industrial arts needs to be drastically modified if it is to meet the needs of a changing technological society.

3. Indicate the extent to which the expectations for industrial art are appropriate for the needs and interest of the students

The curriculum context for industrial arts is based on the industrial model that was universal in the 1940's and not on the contemporary technology model. Consequently, it is not meeting the needs or interest of students who live in or operate in today's technological society. As a result students who take the industrial arts program are technologically illiterate because the program lacks a technology orientation and lacks technological substance.

In some schools the needs and expectations of the students weren't being met because the industrial arts teachers were either ill-prepared or lacked both the theoretical base and the skill base to adequately teach this subject. This was compounded by the fact that the equipment and the tools in these schools were either obsolete or in need of repair.

The needs of students who would enter the world- of-work after leaving school were not being met because they lacked the psychomotor skill base required by industry. Participants felt that this skill base was appropriate for students who continued their education at a technical institute where it could be enlarged and enhanced. The industrial arts program was considered by parents and guidance counsellors as inappropriate either for students who were continuing their education at a college or a university or for those students who would enter a white collar occupation.

4. Indicate problems in achieving these expectations

There are a number of problems that need to be solved before the expectations for industrial arts can be achieved. Among these problems are: curriculum change; changing parental attitudes; in-service education for industrial arts teachers; and adequate funding for the industrial arts program.

Curriculum change is a major problem that personnel of the Ministry of Education and the Department of General Education must come to grips with. It was evident that curriculum content has not had a major revision since the personal computer was brought onto the educational market. Current curriculum content is structured on the industrial model and is organized around tools, machines, and processes found in industry. To reflect the prevalent technologies at the beginning of the 21st century curriculum content organizers should be taken from the dominant technologies of the last decade of the 20th century for it become more technologically relevant.

Closely related to curriculum change is the financial planning and commitment that must be seriously considered if equipment is to be replaced to teach technological concepts and subconcepts. Industrial arts teachers will require moneys to purchase the hardware and software required to teach the technologies selected. The dedicated funds that the Ministry of Education allocates for these purchases must be realistic and be for industrial arts only not for the general revenues of the school. Related to equipment purchase are the renovations that will be required to the physical facilities where these technologies will be taught.

The Ministry of Education must realize and be cognizant of the fact that additional funding will be required and a realistic amount of funds allocated for the purchase of expendable supplies so the industrial arts teachers can provide stimulating instructional activities to their students. The budget allocations at the national and local level need to be drastically increased to keep abreast of the escalating cost of materials, tools, and equipment.

Industrial arts supervisors from the Department of General Education are inadequately prepared to carry out their responsibilities in a professional manner. Some of these supervisors do not posses the know how to operate power equipment or the proper procedures to demonstrate equipment in a safe manner. The interpersonal skills of these supervisors need to be improved and their attitudes as supervisors modified so the teachers are not intimidated by these individuals.

When the paradigm shift to the technology model takes place in-servicing of teachers will be a problem that all stakeholders concerned with industrial arts education will have to face. Without this type of professional activity these teachers will quickly be redundant and the program will become ineffective. This paradigm shift will have a ripple-effect on teacher education because the teacher preparation program for industrial arts teachers will have to be revised and updated. In-service education for teacher educators as well will be paramount.

SMALL-SIZE SCHOOLS

It will be recalled that small-size schools had from 1 to 9 classrooms with one industrial arts teacher who often served in the dual capacity of department head.

Table 2

Participants Ratings: Organization for Instruction

Small Size Schools

N = P 12
T 12
S 24

Descriptive criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Current rationale developed	P	3	27	5	45	4	36	0	0	0	0	0	0	11
	T	3	25	8	66	1	8	0	0	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
2. Philosophy, goals, objectives cooperatively developed	P	6	50	5	41	0	0	1	8	0	0	0	0	12
	T	0	0	1	8	8	66	2	17	0	0	1	8	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24
3. Philosophy, goals, objectives, consistent with local, national philosophies	P	2	17	7	58	2	17	1	8	0	0	0	0	12
	T	3	25	6	50	3	25	0	0	0	0	0	0	12
	S	8	33	11	45	2	8	1	4	2	8	0	0	24

4. Philosophy goals used for planning and evaluation														
	P	5	41	4	33	3	25	0	0	0	0	0	0	12
	T	1	8	6	50	4	33	1	8	0	0	0	0	12
	S	3	12	13	54	7	29	1	4	0	0	0	0	24
5. Philosophy, goals objectives periodically reviewed, revised														
	P	2	17	1	8	6	50	2	17	1	8	0	0	12
	T	0	0	5	41	3	25	2	17	2	17	0	0	12
	S	3	12	7	29	7	29	5	20	1	4	1	4	24
6. Courses represented four broad systems														
	P	2	17	4	33	5	41	0	0	1	8	0	0	12
	T	3	25	5	41	4	33	0	0	0	0	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24
7. Courses planned to achieve objectives														
	P	3	30	4	40	3	30	0	0	0	0	0	0	10
	T	4	33	3	25	3	25	2	17	0	0	0	0	12
	S	4	33	11	45	4	17	5	20	0	0	0	0	24

Table 2 (continued)

Participants Ratings: Organization for Instruction

Small Size Schools

8. Program serves all students														
	P	5	41	5	41	0	0	1	8	1	8	0	0	12
	T	4	33	6	50	0	0	1	8	1	8	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24
9. Program up-dated regularly														
	P	3	27	4	36	2	18	2	18	0	0	0	0	11
	T	1	8	7	58	3	25	1	8	0	0	0	0	12
	S	3	12	13	54	5	20	2	8	1	4	0	0	24
10. Sufficient funds available to achieve program's goals and needs														
	P	2	17	3	25	3	25	3	25	1	8	0	0	12
	T	4	33	4	33	4	33	0	0	0	0	0	0	12
	S	4	17	7	29	7	29	5	20	1	4	0	0	24
11. Adequate support services to support program														
	P	0	0	3	25	6	50	2	17	1	8	0	0	12
	T	1	8	3	25	3	25	4	33	0	0	1	8	12
	S	3	12	12	50	0	0	8	33	1	4	0	0	24

12. Community people used to achieve program goals														
	P	0	0	3	25	6	50	2	17	1	8	0	0	12
	T	1	8	2	17	2	17	5	41	1	8	1	8	12
	S	5	20	4	17	5	20	5	20	4	17	0	0	23
13. Advisory committee used to achieve program goals														
	P	1	9	0	0	3	27	5	45	2	18	0	0	11
	T	0	0	1	8	3	25	5	41	2	17	1	8	12
	S	4	17	8	33	8	33	2	8	2	8	0	0	24
14. opportunity for community partners to participate in program														
	P	0	0	1	8	4	33	6	50	0	0	0	0	11
	T	1	8	4	33	1	8	3	25	2	17	1	8	12
	S	3	12	9	37	3	12	6	25	2	8	1	4	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Organization for Instruction

Principals = 12

Of the 14 criteria that complied this portion of the instrument, 2 of these criteria were rated either 5, excellent, or 4, good, by a combined percent of 75 of the principals from small size schools. These criteria were 2 and 8. As a result of these ratings both of these criteria were placed in the "High" category. Of the 12 remaining criteria 10 were rated either 5 or 4 but their combined percentage was less than 75 % which placed these criteria in the "Adequate" category. In rank order these criteria were 4 (74%), 3 (73%), 1 (72%), 7 (70%), 9 (63%), 6 (50%), 10 (42%), and 5, 11, 12 each with a percentage of 25. These 10 criteria because of their rating were considered to fail to meet accreditation program standards. These criteria must receive the immediate attention of the Department of General Education if industrial arts is to remain a viable subject area at the secondary school level. Criteria 13 (9%) and 14 (8%) were categorized as "Low."

Teachers = 12

The 12 teachers rated 3 of the 12 criteria either 5 or 4 with combined percentages of 75 or higher. Criteria 1 (81%), 8 (80%), and 3 (75%) were categorized as "High." The percentage of nine of the remaining 11 criteria fell within the range of 25 to 74% placing these criteria in the "Adequate" category. In rank order these criteria were: 6, 9, 10 all with 66%, 4 and 7 (58%), 5 and 14 (41%), 11 (33%), and 12 (25%). These nine criteria help to formulate and direct the philosophical foundation for industrial arts and need to be scrutinized by the Department of General Education. Two of the 14 criteria, 2 and 13 each with 8% were placed in the "Low" category.

Students = 24

Students gave a rating of 5, excellent or 4, good, to criteria 1 and 3 when the percentage for each of these ratings was combined it placed them within the 75 to 100% range - 1 (87%) and 3 (78%). Combined percentages within this range were categorized as "High." The remaining 11 criteria had a combined percentage that fell within the 25 to 74% range automatically placing each of these criteria in the category of "Adequate." In rank order these criteria were: 7 (78%), 8 (74%), 4 and 9 (66%), 11 (62%), 2 (61%), 6 (57%),13 (50%), 14 (49%), 10 (46%), 5 (41%), and 12 (37%).

The above analysis shows that both the teachers and the students by their ratings placed 3 of the 14 criteria in the "High" category while the principals placed 2 of the criteria in that category. Both the teacher group and the student group each placed 11 criteria in the "Adequate" category while the principal group place 9 criteria in that category.

Table 3

Participants Ratings: Organization for Instruction Evaluation

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statements		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Philosophy, goals and objectives implemented														
	P	1	8	3	25	6	50	2	17	0	0	0	0	12
	T	1	8	3	25	5	41	3	25	0	0	0	0	12
	S	2	8	13	54	8	33	1	4	0	0	0	0	24
2. Courses available to all students														
	P	3	25	4	33	2	17	2	17	1	8	0	0	12
	T	2	17	3	25	4	33	2	17	1	8	0	0	12
	S	8	33	5	20	3	12	7	29	0	0	1	4	24
3. Schedules, time allotments, class sizes appropriate														
	P	2	17	5	41	4	33	1	8	0	0	0	0	12
	T	2	17	3	25	7	58	0	0	0	0	0	0	12
	S	5	20	9	37	4	17	5	20	1	4	0	0	24

4. Financial support adequate														
	P	1	8	1	8	5	41	3	25	2	17	0	0	12
	T	0	0	3	25	5	41	4	33	0	0	0	0	12
	S	2	8	8	33	8	33	4	17	2	8	0	0	24
5. Adequate cooperative planning														
	P	2	17	1	8	8	66	1	8	0	0	0	0	12
	T	0	0	2	17	7	58	3	25	0	0	0	0	12
	S	4	17	9	37	8	33	2	8	1	4	0	0	24
6. In-school and out-of-school resources used														
	P	1	8	2	17	6	50	2	17	1	8	0	0	12
	T	1	8	4	33	4	33	3	25	0	0	0	0	12
	S	6	25	8	33	4	33	3	12	3	12	0	0	24
7. Program information communicated to stakeholders														
	P	1	8	3	25	4	33	2	17	2	17	0	0	12
	T	1	8	3	25	4	33	4	33	0	0	0	0	12
	S	3	12	7	29	8	33	4	17	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Organization for Instruction Evaluation

Of the 7 statements that participants were ask to evaluate the organization for instruction none of the three groups rated any of these statements that would place them in the "High" category. How each group rated each statements follows:

Principals = 12

The 12 principals rated 6 of the 7 statements either 5 or 4 when these ratings and their percentages were combined they fell within the "Adequate" range which was from 25 to 74%. As a consequence, statements 5 and 3 each with a combined percentage of 58%, statements 1 and 7 38%, and statements 5 and 6 - 25% were placed in the "Adequate" category. Statement 4 had a combined percentage of 16 for the "Low" category. These data are found in Table 3.

Teachers = 12

Similar to the principals group the teachers group by combining the percentage for their 5 and 4 ratings placed 6 of the 7 statements in the "Adequate" category. These statements were 2 and 3, (42%), 6 (41%), 1 and 7 (33%), and 4 (25%). Statement 5 with 17% fell within the 0-24% range for the "Low" category.

Students = 24

By their ratings of 5, excellent and 4, good the 24 students placed all 7 statements in the "Adequate" category. Placed in rank order these statements were: 1 (62%), 6 (58%), 3 (57%), 5 (54%), 2 (52%), and 4 and 7 with 41% each. See Table 3 for these data.

From an analysis of data in Table 3 it is evident that the student group rated more statements directed at the organization for industrial arts instruction "Adequate" than did the other two groups. These groups rated 6 of the 7 statements "Adequate." The principal group rated the financial support given to the industrial arts program "Low" which was an indication that these school administrators were dissatisfied with the financial support they received from the Ministry of Education for the industrial arts program. While the teachers were of the opinion that cooperative planning between them and those responsible for curriculum planning and curriculum development was inadequate.

Suggestions on Organization for Instruction Evaluation

Principals

- There were 7 principals who suggested that in organizing industrial arts in secondary schools, the school should make every attempt to serve the needs of all students including those who do not register for the industrial arts program, so that these students may apply skills and experiences acquired in industrial arts to their daily lives in a society that is becoming highly technologically oriented.

- Five principals suggested through their comments that to provide the right direction for teaching and learning industrial arts, a seminar of school administrators, industrial arts teachers, parents, industry and business people, as well as community lay people be called to brain storm the direction that teaching of industrial arts in secondary schools should take.

- Three principals by their suggestions indicated there was insufficient funding for industrial arts materials and facilities which placed a major constraint on the way the industrial arts program was operated.

- Three principals were implicit in their suggestion that the available supporting budget for industrial arts was insufficient which prevented their schools from organizing an effective industrial arts program that would meet the needs of the students who wish to enroll in this program.

- Two principals commented that part of their school budget came from a school fee that they used to purchase materials for the industrial arts program. Since their schools were prevented from collecting a school fee the majority of the students were exempted from paying this fee because of their economic status. The principals of these schools acquired a budget that was insufficient for organizing the industrial arts program.

Teachers

- Ten of the 12 teachers suggested by their comment that the current industrial arts curriculum does not permit students to gain sufficient skills and knowledge for any type of gainful employment.

- Three teachers by their comments indicated that their schools made no attempt to promote the industrial arts program because the administrative committee of their schools encouraged students to enroll in the college bound stream so that these students could successfully pass the university entrance examination. The success rate of students who passed this examination was considered an indication of the schools academic excellence.

- Two teachers made the suggestion that the administrative committees of their schools should be more considerate and provide support to their industrial arts program.

- Two teachers commented that the administrative committees of their schools were not giving the industrial arts program top priority or a fair share of the school budget.

Students

- There were 10 of 24 students who made the comment that the instructional time allocated for industrial arts courses in their schools was insufficient.

- Nine students commented that there should be more variety of industrial arts courses offered in their schools to meet the individual needs and future career goals of the students.

- Six students stated in their comments that they wished there would be sufficient facilities, materials, equipment, with supporting budget, so the school could organize an efficient industrial arts program.

- Five students by their comments stated their schools lacked sufficient facilities for a quality industrial arts program. To accommodate this deficiency, off-campus types of cooperative education and other community resources should be used to supplement in-school instruction.

- Three students commented that their schools had not fully cooperated with local resource persons who could have been used by their schools to support the teaching of industrial arts.

- Three students made the suggestion that instructional time for industrial arts courses be increased to allow students the opportunity to gain additional skills and knowledge that would be sufficient for the students to either further their education or to enter some type of future employment.

Table 4

Participants Ratings: Description of Offerings

Small Size Schools

N = P 12
T 12
S 24

Descriptive criteria		Rating											
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Based on technological concepts, processes, and systems														
	P	8	66	2	17	2	17	0	0	0	0	0	0	12
	T	0	0	3	25	8	66	0	0	1	8	0	0	12
	S	4	17	10	41	8	33	1	4	1	4	0	0	24
2. Knowledge technological development effected on people														
	P	6	50	4	33	1	8	0	0	1	8	0	0	12
	T	2	17	4	33	2	17	3	25	1	8	0	0	12
	S	5	20	9	37	7	29	3	12	0	0	0	0	24

3. Content drawn from three major areas													
	P	6	50	5	41	1	8	0	0	0	0	0	0	12
	T	4	33	4	33	3	25	0	0	1	8	0	0	12
	S	1	4	8	33	10	41	4	17	1	4	0	0	24
4. Developing understanding, and application of technological concepts														
	P	6	50	4	33	1	8	1	8	0	0	0	0	12
	T	1	9	5	45	4	36	1	9	0	0	0	0	11
	S	6	25	5	20	10	41	2	8	1	4	0	0	24
5. Apply tools, materials, processes, and concepts safely														
	P	7	58	4	33	1	8	0	0	0	0	0	0	12
	T	4	33	4	33	3	25	1	8	0	0	0	0	12
	S	12	50	7	29	3	12	2	8	0	0	0	0	24
6. Develop skills, creative abilities, and technological potentials														
	P	7	58	3	25	2	17	0	0	0	0	0	0	12
	T	3	25	4	33	5	4	0	0	0	0	0	0	12
	S	3	12	10	41	7	29	3	12	0	0	1	4	24
7. Develop problem-solving, decision-making ability														
	P	7	58	4	33	1	8	0	0	0	0	0	0	12
	T	3	25	4	33	5	41	0	0	0	0	0	0	12
	S	7	29	7	29	7	29	2	8	1	4	0	0	24

Table 4 (continued)

Participants Ratings: Description of Offerings

Small Size Schools

8. Prepare for lifelong learning														
	P	8	72	3	27	1	9	0	0	0	0	0	0	11
	T	1	8	8	66	2	17	1	8	0	0	0	0	12
	S	7	29	9	37	6	25	2	8	0	0	0	0	24
9. Activities reinforces abstract concepts with concrete experiences														
	P	7	58	5	41	0	0	0	0	0	0	0	0	12
	T	3	27	4	36	4	36	0	0	0	0	0	0	11
	S	8	33	8	33	8	33	0	0	0	0	0	0	24
10. Emphasis on combination of "know-how" and "ability to do."														
	P	11	91	1	8	0	0	0	0	0	0	0	0	12
	T	5	41	6	50	1	8	0	0	0	0	0	0	12
	S	9	37	8	33	5	20	1	4	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Description of Offerings

Data in Table 4 present frequencies and percentages for the ratings that each sub-population gave to the 10 descriptive criteria that were used to evaluate the description of industrial arts courses offerings in the 12 small-size participants schools.

Principals = 12

These data indicate that 9 of the 10 criteria were rated by the 12 principals with one, criterion 8, being rated by 11 of the principals. All criteria statements were rated either 5 or 4 with combined percentages above the 75% cut off point. As a result of these percentages all criteria were placed in the "High" category. In rank order these criteria and their percentages were: 8, 9, 10, (99%), 3, 5, 7, (91%), and 1, 2, 4, 6, (83%).

Teachers = 12

Data in Table 4 show that the 12 industrial arts teachers who taught in small size schools rated criterion 10 either 5, excellent, or 4, good. When combined the percentage for these two ratings was 91% which placed it in the "High" category. The remaining 9 criteria statements were rated 3, moderate. The percentages for these criteria fell within the 25 to 74% range automatically categorizing these criteria as "Adequate." The following is a rank order with percentages for these 9 criteria: 8 (74%) 3, 5 (66%), 9 (63%), 6, 7 (58%), 4 (54%), 2 (60%) and 1 (25%).

Students = 24

The 24 industrial arts students from small size schools who served as members of self-evaluation committees for these schools gave a rating of either 5 or 4 to criterion 5 with a combined percentage of 79%. That percentage placed this criterion in the "High" category. The remaining 9 criteria as a result of combining percentages for their ratings which fell between 25 and 74% were placed in the "Adequate" category. These criteria in rank order according to their combined percentages were: 10 (70%), 8, 9 (66%), 1, 7 (58%), 2 (57%), 6 (53%), 4 (45%) and 3 (37%).

An analysis of the above data show that the perceptions the principals had for the industrial arts course offerings in their schools differed significantly from the perceptions of the other two groups. This was evident by the number of criteria the principals placed in the "High" category. Both the teacher group and the student group rated these offerings as only being "Adequate." This is an indication of the divergent thinking among administrators, practitioners, and those who receive instruction. To bring these groups into congruency of thought the Ministry of Education must review the philosophy and the curriculum content for the industrial arts program as soon as it is feasible.

Table 5

Participants Ratings: Description of Offerings (Evaluation)

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Information and experiences related to technology														
	P	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	1	8	6	50	5	41	0	0	0	0	0	0	12
	S	3	12	12	50	8	33	1	4	0	0	0	0	24
2.Scope and sequence related to student's developmental needs														
	P	3	25	3	25	6	50	0	0	0	0	0	0	12
	T	0	0	7	58	5	41	0	0	0	0	0	0	12
	S	5	20	9	37	9	37	1	4	0	0	0	0	24

3. Problem-solving experiences with tools, material, and technological concepts														
	P	2	17	9	75	1	8	0	0	0	0	0	0	12
	T	2	17	7	58	3	25	0	0	0	0	0	0	12
	S	6	25	11	45	6	25	1	4	0	0	0	0	24
4. Technological development and its effect on people/environment														
	P	1	8	2	17	9	75	0	0	0	0	0	0	12
	T	0	0	3	25	5	41	4	33	0	0	0	0	12
	S	2	8	9	37	12	50	1	4	0	0	0	0	24
5. Develop students' responsibility and leadership														
	P	2	17	5	41	5	41	0	0	0	0	0	0	12
	T	0	0	8	66	4	33	0	0	0	0	0	0	12
	S	6	25	10	41	7	29	1	4	0	0	0	0	24
6. Program flexibility to meet needs of all students														
	P	2	17	5	41	5	41	0	0	0	0	0	0	12
	T	1	8	4	33	5	41	2	17	0	0	0	0	12
	S	3	12	8	33	8	33	5	20	0	0	0	0	24

Table 5 (continued)

Participants Ratings: Description of Offerings (Evaluation)

Small Size Schools

7. Students exhibit safe working habits

P	3	25	6	50	3	25	0	0	0	0	0	0	12
T	2	17	8	66	2	17	0	0	0	0	0	0	12
S	4	17	13	54	7	29	0	0	0	0	0	0	24

Percentage total may be less than or greater than 100 because of rounding.

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Description of Offerings (Evaluation)

Data in the above table presents the frequencies and the percentages for each of the 7 statements directed at the evaluation of description of offerings of industrial arts courses in the 12 small size schools involved in the research.

Principals = 12

In Table 5 are data which indicate that of the 7 evaluation statements directed at the evaluation of the industrial arts course offerings the 12 principals of small size schools rated statements 3 and 7 either 5 or 4 with a respective combined percentage of 92 and 75%. This qualified to place these statements into the "High" category. The ratings for the remaining five statements placed them in the "Adequate" category. A rank order for these statements with percentages follow: 1 (66%), 5, 6 (58%), 2 (50%), and 4 (25%).

Teachers = 12

Of the 7 evaluation statements in Table 5 statements 7 and 3 were rated either 5 or 4 by the 12 industrial arts teachers in small size schools. The combined percentages for these statements respectively were 83% and 75%, placing these statements in the "High" category. Both of these statements were placed in the same category by the school principals.

Statements 5 (66%), 2 (58%), 1 (51%), 6 (41%) and 4 (25%) were categorized as "Adequate" because their combined percentage for the 5 or 4 rating were within the 25 to 74% range.

Students = 24

The 24 industrial arts students members of the self evaluation committee in the 12 small size school as a result of their ratings to the 7 evaluation statements place all of these statements in the "Adequate" category. A rank order for these statements with percentages follow: 7 (71%), 3 (70%), 2, 5, (66%), 1 (62%) and 3, 6 (45%).

An analysis of these data show that all three groups were concerned with the safety of students enrolled in the industrial arts program. This is evident by the rating given to evaluation statement 7 by all three groups. All three groups felt that the industrial arts program should involved the student to have problem solving experiences with tools, materials, and processes for the student acquire technological concepts. Members of the self-evaluation committees by their ratings to the other statements felt that the statements were being "Adequately" fulfilled by the industrial arts program. For the purpose of this research and "Adequate" placement of a statement in that category mean that it was not appropriate for accreditation by NSSE standards. These are the statements that the Ministry of

Education must critically review and revise to keep the industrial arts program viable.

Suggestions on Description of Offerings: Evaluation

Principals

- Three principals made the suggestion that industrial arts program graduates of upper level secondary schools should have the same qualifications and privileges as graduates of vocational schools, since both streams of education require the same number of year of schooling.

- Three principals suggested that their schools needed to offer a wider variety of industrial arts courses in order to suit the needs of both the students and the communities in which the student reside.

- Three principals indicated by their suggestions that some of the industrial arts courses offered in their schools were not meeting the needs of all students who wish to take these courses. These courses were automotive, electricity and electronics, and metalwork. This comment was made because their schools lacked both the facilities and the equipment to teach these courses.

Teachers

- Ten teachers made the suggestion that both the students and the communities in their service areas would like to see the vocational education certificate program currently being offered in big cities in vocational education schools be extended to rural secondary schools. This would allow more students access to this program which would enable students upon graduation to further their education at technical institutions.

- Seven teachers by the suggestion they made indicated that they found teaching industrial arts in secondary schools to be a satisfactory experience. However, in order for them to improve the quality of teaching industrial arts at this level of education, it is necessary that they be provided with sufficient facilities and equipment.

- Four teachers commented that the content of the current industrial arts course was not equivalent to the content of vocational education courses in term of skills, knowledge, and experiences students acquire at the end of instruction.

Students

- It was evident that seven students, from what they suggested, were not satisfied with the way their school offered basic industrial arts courses because these course taught very limited skills, knowledge, and experiences. These were not sufficient for students to either further their education or to find gainful employment after graduating from school.

- Five students made the suggestion that their schools should make arrangements for those students with outstanding talents in industrial arts to have the opportunity to further their education or training in the students subjects of expertise.

- Four students made the comment that the current industrial arts courses offered in secondary schools were identical on a nationwide basis. These students were of the opinion that the individual school should be responsive to the needs of the particular community and the students the school serves and offer relevant courses to these stakeholders.

Table 6

Participants Ratings: Components of Instructional Program - Faculty

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Meet degree certification and competency requirements														
	P	7	58	5	41	0	0	0	0	0	0	0	0	12
	T	5	41	5	41	2	17	0	0	0	0	0	0	12
	S	10	41	11	45	3	12	0	0	0	0	0	0	24
2. Competent in researching, planning, directing, evaluating activities														
	P	6	50	5	41	1	8	0	0	0	0	0	0	12
	T	5	41	5	41	2	17	0	0	0	0	0	0	12
	S	9	37	12	50	2	8	1	4	0	0	0	0	24

3. Broad preparation and certification in four major systems														
	P	5	41	6	50	1	8	0	0	0	0	0	0	12
	T	2	17	2	17	4	33	2	17	1	8	1	8	12
	S	4	17	10	41	10	41	0	0	0	0	0	0	24
4. Technically competent in assigned teaching area(s)														
	P	6	50	5	41	0	0	0	0	1	8	0	0	12
	T	5	41	5	41	2	17	0	0	0	0	0	0	12
	S	10	41	8	33	4	17	2	8	0	0	0	0	24
5. Knowledge of legal requirements for laboratory operation														
	P	6	50	6	50	0	0	0	0	0	0	0	0	12
	T	6	50	5	41	1	8	0	0	0	0	0	0	12
	S	7	29	13	54	2	8	2	8	0	0	0	0	24
6. Possesses plan to develop professional, technical competencies														
	P	7	58	4	33	1	8	0	0	0	0	0	0	12
	T	6	50	5	41	1	8	0	0	0	0	0	0	12
	S	5	20	10	41	8	33	1	4	0	0	0	0	24

Table 6 (continued)

Participants Ratings: Components of Instructional Program - Faculty

Small Size Schools

7. Cooperation plan with supporting personnel implementation of instruction													
P	4	33	6	50	2	17	0	0	0	0	0	0	12
T	2	17	5	41	5	41	0	0	0	0	0	0	12
S	6	25	7	29	9	37	2	8	0	0	0	0	24
8. Possession of current knowledge of industrial education													
P	4	33	6	50	1	8	0	0	1	8	0	0	12
T	4	33	6	50	2	17	0	0	0	0	0	0	12
S	8	33	8	33	5	20	3	12	0	0	0	0	24
9. Adheres to written code of ethics													
P	6	50	6	50	0	0	0	0	0	0	0	0	12
T	5	41	5	41	2	17	0	0	0	0	0	0	12
S	11	45	7	29	5	20	1	4	0	0	0	0	24

10. Competent in written, oral language skills

P	4	33	8	66	0	0	0	0	0	0	0	0	12
T	6	50	3	25	3	25	0	0	0	0	0	0	12
S	4	17	7	29	7	29	5	20	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of Instructional Program - Faculty

Table 6 presents the frequencies and the percentages for each of the ten descriptive criteria directed at the industrial arts faculty in the 12 small size participating schools.

Principals = 12

These data indicate that of the 10 criteria presented, all were rated either 5, excellent or 4, good with a combined percentage for each criteria which ranged from 75 to 100%. These percentages placed each criterion into the "Adequate" category. In rank order, these criteria were: 5, 9 (100%), 1, 10 (99%), 2, 3, 4 (91%) and 7, 8 (83%).

Teachers = 12

There are data in Table 6 for the 12 industrial arts teachers which show their ratings for the faculty component for the industrial arts instructional program. As a result of these ratings 8 of the 10 criteria were placed in the "High" category. Ratings given to the two remaining criteria placed them in the "Adequate" category. In rank order criteria categorized as "High" included: 5, 6 (91%), 8 (83%), 1, 2, 4, 9 (82%) and 10 (75%). Those categorized as "Adequate" 7 (50%) and 3 (34%).

Students = 24

Data for the 24 industrial arts students who were members of the Self-Evaluation Committees for the 12 small size schools show that by raking criteria either 5, excellent or 4, good and combining the percentage for each criterion three of the 10 criteria were placed in the "High" category. These criteria were: 2 (87%), 1 (86%) and 5 (83%). The remaining 7 criteria were all placed in the "Adequate" category. These criteria with combined percentage in rank order were: 4, 9 (74%), 8 (66%), 6 (61%), 3 (58%), 7 (54%) and 10 (46%).

A comparison of the above data show that the students perception of the industrial arts faculty in their schools differed from the perceptions that the principals and the teachers held. These students felt that these teachers were professionally prepared and certified to teach this subject area but need to improve in the other criteria. The perceptions of the principals and the teachers was that industrial arts faculty were professional and competent as teachers. The teachers felt that cooperative planning with support personal needed to be improved.

Table 7

Participants Ratings: Components of Instructional Program - Faculty - (Evaluation)

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate preparation to teach subjects														
	P	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	4	33	4	33	4	33	0	0	0	0	0	0	12
	S	2	8	13	54	8	33	1	4	0	0	0	0	12
2. Informed of current educational developments														
	P	4	33	4	33	4	33	0	0	0	0	0	0	12
	T	1	8	3	25	3	25	5	41	0	0	0	0	12
	S	8	33	5	20	3	12	7	29	0	0	1	4	24
3. Commitment to professional growth														
	P	4	33	4	33	4	33	0	0	0	0	0	0	12
	T	2	17	3	25	7	58	0	0	0	0	0	0	12
	S	5	20	9	37	4	17	5	20	1	4	0	0	24

4. Well-defined industrial point of view toward specialization														
	P	3	25	6	50	3	25	0	0	0	0	0	0	12
	T	3	25	4	33	5	41	0	0	0	0	0	0	12
	S	2	8	8	33	8	33	4	17	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of Instructional Program - Faculty - (Evaluation)

In Table 7 are data which presents frequencies in the form of ratings and a percentages for each of the four evaluative statements that were used to evaluate the faculty component of the instructional program for industrial arts in 12 small size schools involved in this study.

Principal = 12

The data indicate that of the four evaluative statements directed at an evaluation of the faculty components of instructional program for industrial arts programs in 12 small size participating schools, statement 4, was rated 5 or 4 by 75% of the principals. That percent placed this statement in the "High" category. The remaining three statements 1, 2, 3 (66%) as a result of their percentage were categorized as "Adequate."

Teachers = 12

Although the 12 teachers rated all four statements either 5 or 4, the combined percent for each statement placed it a the range between 25 and 74% or "Adequate." The combined percent for three of the four statements was lower that the percent given these statements by the principals groups. These statements were: 4 (58%), 3 (42%) and 2 (33%). Both groups gave a combined percents of 66 to statement 1.

Students = 24

The 24 industrial arts student members of the Self-Evaluation Committees, like the teacher members, by their ratings either 5 or 4, they gave to the four evaluation statements that concentrated on the faculty component of the industrial program all four were placed in the "Adequate" category with combined percentages that ranged from a Low of 41 to a High of 62%.

An analysis of the above data show that the teacher group was most critical of faculty than either the principals or the teachers. It was the perception of these teachers that their counterparts were not keeping informed of contemporary educational developments as they impact on industrial arts education nor had they committed themselves to professional growth and development they were only interested in maintaining the status quo. The student group had similar perceptions of the industrial arts faculty. However, the student group was the only group who perceived that the industrial arts faculty in their schools did not have a well defined industrial point of view towards their specialization.

Suggestion on Instructional Program - Faculty - (Evaluation)

Principals

- There were ten principals who suggested that the Department of General Education should regularly organize a seminar to retrain and upgrade industrial arts teachers with the new skills and knowledge needed to keep them update with the current technology, and thus enable industrial arts teachers to do their teaching more efficiently.

- Ten principals suggested that there was an insufficient supply of industrial arts teachers to meet the demands of secondary schools because these teachers with their skills and abilities could earn a better income by working for private industry. In order to attract well-qualified industrial arts teachers for secondary schools, it is necessary that these teachers be provided with a suitable fringe benefit package.

- Nine principals believed that there was an urgent need for a greater number well-qualified industrial arts teachers to meet the demand for these teachers at the secondary school level. Presently, as a result of the shortage of well-qualified industrial arts teachers, the demand is being fulfilled by recruiting either technicians or skilled tradesmen from industry. These tradesmen have never taken any teacher education courses before they entered the classroom or shop. As a consequence, these skilled tradesmen were unable to organize the instructional activities for industrial arts in an efficient manner. Therefore, a teacher education program for tradesmen to learn the correct industrial arts teaching procedures to teach this subject area would be beneficial to all stakeholder groups.

- Three principals suggested there should be an organization responsible for promoting secondary school industrial arts teaching formed. Among the responsibilities suggested for such an organization would be: to organize on a schedule basis in-service training for industrial arts teachers where they could upgrade their skills or develop new skills and knowledge with current technology; to recommend revisions of the industrial arts curriculum whenever necessary; to serve as a depository for technical and curriculum development information; a meeting center for industrial arts teachers where they that could be exchange professional information; and to provide industrial arts teachers with instructional materials, and technical text books.

- Four principals made the suggestion that it was necessary that in-service training be organized for industrial arts in the following areas:

1. The acquisition of current skills and knowledge in assigned teaching areas.
2. The management of process skills.
3. The preparation of goals and objectives, that would provide direction to the industrial art program.

Teachers

- Ten industrial arts teachers through their comments indicated that the school administrators do not consider them as key persons of their schools, because they were seldom selected to attend any in-service training to up-date their knowledge and skills that would improve their professional competencies. These teachers also suggested that if the quality of the industrial arts program were to be improved, it is imperative that industrial arts teachers be provided with personnel development activities.

- Seven industrial arts teachers suggested that school administrators should recognize the importance of industrial arts and provide industrial arts staff with the most current professional publications so the staff may keep up-date with what is occurring in industry and technology.

Students

- Ten industrial arts students suggested that industrial arts teachers were very competent in their subject area, but the teachers should devote themselves more to teaching and spend more time assisting students both in class and after class.

- Six industrial arts students indicated there was a need for who could offer a greater more capable teachers with competencies in different industrial arts areas, and more variety of industrial arts course.

- Three industrial arts students felt the student teachers they had from the different institutions was a great advantage for them. These student teachers provided different points of view in counseling as well as different techniques in the way that things were done.

- Three students indicated by their suggestions that some industrial arts teachers were lacking in experience and in competencies for teaching the areas they were assigned to teach.

Table 8

Participants Ratings: Components of the Instructional Program - Instructional Activities

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Teacher planning consistent with program goals, and course objectives														
	P	2	17	10	83	0	0	0	0	0	0	0	0	12
	T	2	17	9	75	1	8	0	0	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
2. Lesson plans based on course of study, and student needs														
	P	1	8	9	75	2	17	0	0	0	0	0	0	12
	T	2	17	5	41	4	33	0	0	0	0	1	8	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24

3. Teacher develop/obtain appropriate, up-to-date instructional materials														
	P	0	0	4	33	7	58	1	8	0	0	0	0	12
	T	0	0	4	33	5	41	3	25	0	0	0	0	12
	S	8	33	11	45	2	8	1	4	2	8	0	0	24
4. Plan/provide for evaluation of instruction														
	P	2	17	7	58	3	25	0	0	0	0	0	0	12
	T	1	8	10	83	0	0	1	8	0	0	0	0	12
	S	3	12	13	54	7	29	1	4	0	0	0	0	24
5. Alternative methods used to assist students to meet course objectives														
	P	3	25	3	25	6	50	0	0	0	0	0	0	12
	T	4	33	4	33	4	33	0	0	0	0	0	0	12
	S	3	12	7	29	7	29	5	20	1	4	1	4	24
6. Activities develop understanding of technology														
	P	1	8	5	41	6	50	0	0	0	0	0	0	12
	T	2	17	3	25	7	58	0	0	0	0	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24
7. Improve students ability to make career choices														
	P	1	8	5	41	6	50	0	0	0	0	0	0	12
	T	5	41	4	33	2	17	1	8	0	0	0	0	12
	S	4	33	11	45	4	17	5	20	0	0	0	0	24

Table 8 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Small Size Schools

8. Equip students with transferable skills for further preparation														
	P	3	25	3	25	6	50	0	0	0	0	0	0	12
	T	3	25	4	33	3	25	2	17	0	0	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24
9. Emphasis on lifelong learning in technological society														
	P	2	17	8	66	2	17	0	0	0	0	0	0	12
	T	4	33	4	33	4	33	0	0	0	0	0	0	12
	S	3	12	13	54	5	20	2	8	1	4	0	0	24
10. Develop skills, positive self-concepts, individual potentials in technology														
	P	2	17	9	75	1	8	0	0	0	0	0	0	12
	T	5	41	5	41	2	17	0	0	0	0	0	0	12
	S	4	17	7	29	7	29	5	20	1	4	0	0	24
11. Application of tools, materials, machines, processes, technical concepts taught														
	P	4	33	5	41	3	25	0	0	0	0	0	0	12
	T	3	25	7	58	0	0	2	17	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24

12. Creative, critical thinking, decision making, problem solving skills taught														
	P	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	4	33	6	50	1	8	1	8	0	0	0	0	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24
13. Teacher-centered and student-centered instructional methods used														
	P	1	8	7	58	4	33	0	0	0	0	0	0	12
	T	3	25	6	50	3	25	0	0	0	0	0	0	12
	S	8	33	11	45	2	8	1	4	2	8	0	0	24
14. Multi-disciplinary learning opportunities provided														
	P	1	8	8	66	2	17	1	8	0	0	0	0	12
	T	3	25	4	33	4	33	1	8	0	0	0	0	12
	S	3	12	13	54	7	29	1	4	0	0	0	0	24
15. Group and individual learning activities used														
	P	2	17	7	58	2	17	1	8	0	0	0	0	12
	T	2	17	9	75	1	8	0	0	0	0	0	0	12
	S	3	12	7	29	7	29	5	20	1	4	1	4	24

Table 8 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Small Size Schools

16. Student leadership skills developed through curricular, co-curricular activities														
	P	2	17	4	33	4	33	2	17	0	0	0	0	12
	T	3	25	3	25	6	50	0	0	0	0	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24
17. Community resources supplement instruction														
	P	1	8	0	0	9	75	1	8	1	8	0	0	12
	T	1	8	3	25	4	33	3	25	1	8	0	0	12
	S	4	33	11	45	4	17	5	20	0	0	0	0	24
18. Students use in-school and out-of-school resources														
	P	2	17	2	17	7	58	1	8	0	0	0	0	12
	T	2	17	4	33	3	25	3	25	0	0	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Instructional Activities

Data collected with the 18 criteria for the instructional activities section of the research instrument were used to organize Table 8. For easy of analysis these data are shown as frequencies and percentages. For placement of a criterion into a category a combined percent was established by combining the percent for ratings 5 and 4, "High" category, 3, "Adequate" category and 2 and 1, "Low" category.

Principals = 12

In Table 8 are data which show that the 12 principals rated criteria 1, 2, 4, 9, and 10 either 5, excellent, or 4, good, in rank order the criteria had the following combined percent 1, (100%), 10 (92%), 4, (75%), 2 and 9 (83%). Since the percentages were within the 75-100% range they were categorized as "High." Twelve of the descriptive criteria that the 12 principals rated where placed in the "Adequate" category. These criteria in rank order for their combined percent were: 11, 14 (74%), 15 (73%), 12, 13 (66%), 5, 8, 16 (50%), 7 (49%), 6 (42%), 18 (37%) and 3 (33%). Criterion 17 had a percentage of 8 for the "Low" category.

Teachers = 12

The data presented in the above Table show that the 12 industrial arts teachers who were members of the self-evaluation committees for small size schools gave a rating of either 5, or 4 to 7 of the 18 instructional activities descriptive criteria. A rank order for each criterion with a combined percent follow: 1, 15 (92%), 4 (91%), 11, 12 (85%), 10 (82%) and 13 (75%). The percent for these criteria fell within the 75 to 100% range automatically placing each in the "High" category. The remaining 11 criteria had combined percentages that ranged from 33 to 74%, placing each criterion in the "Adequate" category which had a range from 25 to 70%. The following is a range order by criterion and percent: 7 (74%), 5, 9, (66%), 2, 8 and 14 (58%), 16, 18 (50%), 6 (42%), and 13, 17 (33%).

Students = 24

The data being analyzed indicate that the 24 students rated one-third of the 18 descriptive criteria either 5, excellent or 4, good. A rank order for these criteria with a related percents follows: 1, 11 (87%),and 3, 7, 13, 17(78%). As a consequence of their combined percent each of these criteria were placed in the "High" category. The 12 remaining criteria were categorized as "Adequate" because their combined percent ranged from a Low of 41 to a High of 74. For a criterion to be placed in the "Adequate" category it had to have a combined percent between 24 and 75. In rank order recording to percent these criteria were: 8, 18 (74%), 4, 9, 14 (66%), 2, 12 (61%), 6, 16 (57%), 10 (46%), and 5, 15 (41%).

An analysis of the above data show that the receivers of instruction in industrial arts, the students, placed the greatest number, 11, of criteria in the "High" category. This could indicate satisfaction on the part of the students in small schools with the instruction they received. This group of participants were less than satisfied with the alternative methods industrial arts teachers used to achieve the course objectives.

The teachers by their ratings indicate they used the correct processes to structure and present instructional content and the methods they used to meet the need of individual students. Their greatest dissatisfaction was their inability to obtain appropriate contemporary instructional materials for classroom use.

Principals placed the least number of criteria in the "High" category, 4, these criteria concentrated on the organization of instruction and the effects of instruction on the student. This would be the result of the role of the principal in the school who felt the teacher was responsible as a professional to organize, prepare, and present instruction.

Table 9

Participants Ratings: Components of the Instructional Program - Instructional Activities (Evaluation)

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional activities effectively relate to students' needs, goals														
	P	2	17	7	58	3	25	0	0	0	0	0	0	12
	T	1	8	7	58	4	33	0	0	0	0	0	0	12
	S	2	8	13	54	8	33	1	4	0	0	0	0	24
2. Adequate planning, preparation for instructional program														
	P	1	8	6	50	5	41	0	0	0	0	0	0	12
	T	1	8	4	33	6	50	1	8	0	0	0	0	12
	S	8	33	5	20	3	12	7	29	0	0	1	4	24

3. Community resources effectively incorporated into instructional program														
	P	1	8	2	17	6	50	2	17	1	8	0	0	12
	T	2	17	1	8	3	25	5	41	1	8	0	0	12
	S	5	20	9	37	4	17	5	20	1	4	0	0	24
4. Teachers effectively work with academic teachers														
	P	2	17	3	25	6	50	1	8	0	0	0	0	12
	T	3	25	3	25	3	25	3	25	0	0	0	0	12
	S	2	8	8	33	8	33	4	17	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Instructional Activities (Evaluation)

For the evaluation of the Instructional activities of the Instructional Program, participants were asked to rate four evaluation statements. The number from each group rating the statement and the rating that statement received comprise the data found in Table 9.

Principals = 12

The frequencies and percentages for the ratings given to the four statements by the principal group show that the principals rated all four statement either 5 or 4. The combined percent for these statements ranged from a low of 25 to a high of 75. Statement 1, because it received 75% was placed in the "High" category. The percent for that category ranged from 75 to 100. Placed in rank order according to percent the other three statements 2 (58%); 4 (43%); and 3 (25%). Because these percentages fell within the 25 to 74 percent range the statements were placed in the "Adequate" category.

Teachers = 12

The 12 Industrial Arts teachers rated each of the four statements either 5, Excellent or 4, Good. When the percent for each rating was combined, these statements were placed in the "Adequate" category. According to the combined percent for each statement a rank order was 1 (66%); 4 (50%); 2 (41%); and 3 (25%). All these percentages were within the 25 to 74% range which was the range of the "Adequate" category.

Students = 24

Like the other two groups that formed the Self-Evaluation Committees in the 12 small-size schools, the 24 Industrial arts students rated the four evaluation statements either 5 or 4. When the percent for each rating was combined, each statement was placed in the "Adequate" category. The combined percent for the four statements ranged from 41% to 62%. For a combined percent to be placed in the "Adequate" category, it had to range from 25 to 74%. In rank order these combined percentages were: 1 (62%); 3 (51%); 2 (53%); and 4 (41%).

The above analysis show that all three groups by their ratings to the four statements according to combined percentages had all four statements placed in the "Adequate" category. These ratings, although, "Adequate" need to be improved by those who supervise instruction and those who give instruction if the Industrial Arts program is to meet its established goals. The teachers by their ratings to the planning and preparation for instruction indicated they need to improve in these activities of the instructional process. This may necessitate an attitudinal change on their part; that they are part of the professional and not employed as some paraprofessional.

Suggestions on Instructional Activities (Evaluation)

Components of the Instructional Program

Principals

- Six principals suggested that the Industrial Arts teachers use a variety of instructional activities that would be appropriate to the community setting that would provide useful projects for use.

- Four principals believed that in order for the Industrial Arts teachers to organize effective instructional activities for their courses, the school needs to establish a mission statement with clearly stated objectives for these teachers to follow; for instance, whether to provide basic exploratory experience or to provide career training.

- Three principals reported that their schools could offer very limited industrial arts instructional activities in some areas because of a shortage of industrial arts personnel who had the competencies to teach in these areas.

- Three principals felt that the facilities and the equipment that were available in the industrial arts school shops for small-size schools were not appropriate to current technologies found in today's society.

- Three principals suggested that for the Industrial Arts program to be effective, sufficient and up-to-date equipment is a major factor for organizing industrial arts instructional activities so that they are realistic and relevant.

- Three principals suggested that they found that it is imperative for the school maintain good public relations with the community and collaborate with industry, business, and parents in the community if it is to receive these stakeholders' support for instructional activities by providing the school with materials, resource persons, and budget.

- Two principals indicated what they needed were realistic evaluative criteria for evaluating both the industrial arts instructional activities and the students' achievement in industrial arts.

Teachers

- Ten teachers reported that their schools could offer very limited industrial arts activities because of lack of adequate facilities and equipment that they needed to organize the school's industrial arts activities that would be effective with students.

- Eight of the 24 teachers indicated by their suggestions that their schools were urgently in need of industrial arts textbooks, and other instructional materials that would support the instructional activities they would organize for their students.

- Seven teachers made the suggestions that the industrial arts facilities and equipment that was available in their shops were obsolete and inappropriate for a highly oriented technology society.

- Five teachers said that the majority of textbooks that concentrate on technology that were available in their schools were written in English which made it inconvenient for the industrial arts staff to use.

Students

- Ten industrial arts students consider the shops of their schools to have insufficient space for conducting Industrial Arts instructional activities.

- Seven industrial arts students concluded that, because of insufficient facilities and equipment in their industrial arts shops, and large class sizes, students have to wait an inordinate period of time before they had the opportunity to use tools and equipment.

- Six industrial arts students felt that experiences and competent Industrial Arts teachers was a very important factor for the presentation of effective instructional activities. These students felt it was imperative that experienced teachers be employed for every area of the Industrial Arts program.

Table 10

Participants Ratings: Components of the Intructional Program - Materials and Media

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Wide range reading materials available														
	P	0	0	4	33	6	50	2	17	0	0	0	0	12
	T	0	0	1	8	4	33	7	58	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
2. Material provided for different student ability levels														
	P	3	25	3	25	4	33	2	17	0	0	0	0	12
	T	0	0	2	17	6	50	4	33	0	0	0	0	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24

3. Variety of instructional equipment available and used

P	2	17	5	41	3	25	2	17	0	0	0	0	12
T	0	0	2	17	8	66	2	17	0	0	0	0	12
S	8	33	11	45	2	8	1	4	2	8	0	0	24

4. Resource units, study guides, support materials used

P	2	17	3	25	4	33	3	25	0	0	0	0	12
T	0	0	0	0	9	75	3	25	0	0	0	0	12
S	3	12	13	54	7	29	1	4	0	0	0	0	24

5. Adequate instructional materials to meet program goals

P	2	17	3	25	4	33	2	17	1	8	0	0	12
T	0	0	3	25	6	50	3	25	0	0	0	0	12
S	3	12	7	29	7	29	5	20	1	4	1	4	24

6. Instructional materials provided for occupational experiences stimulation

P	1	8	6	50	5	41	0	0	0	0	0	0	12
T	0	0	5	41	6	50	0	0	1	8	0	0	12
S	5	20	9	37	7	29	1	4	2	8	0	0	24

Table 10 (continued)

Participants Ratings: Components of the Intructional Program - Materials and Media

Small Size Schools

6. Instructional materials provided for occupational experiences stimulation														
	P	1	8	6	50	5	41	0	0	0	0	0	0	12
	T	0	0	5	41	6	50	0	0	1	8	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24
7. Copyright law observed in reproducing and using copyrighted materials														
	P	3	25	3	25	4	33	0	0	1	8	1	8	12
	T	2	17	5	41	3	25	0	0	1	8	1	8	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24
8. Guidelines established for selecting new instructional materials														
	P	1	8	7	58	2	17	2	17	0	0	0	0	12
	T	1	8	4	33	3	25	2	17	2	17	0	0	12
	S	4	33	11	45	4	17	5	20	0	0	0	0	24
9. Faculty participate in selecting instructional material														
	P	3	25	4	33	3	25	2	17	0	0	0	0	12
	T	2	17	6	50	3	25	1	8	0	0	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24

10. Media faculty members participate in selecting new materials														
	P	2	17	7	58	2	17	1	8	0	0	0	0	12
	T	3	25	3	25	2	17	3	25	1	8	0	0	12
	S	3	12	13	54	5	20	2	8	1	4	0	0	24
11. Current professional publications available to teachers														
	P	2	17	5	41	4	33	1	8	0	0	0	0	12
	T	1	8	3	25	5	41	1	8	2	17	0	0	12
	S	4	17	7	29	7	29	5	20	1	4	0	0	24
12. Audio-visual materials readily available for teacher use														
	P	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	3	25	8	66	1	8	0	0	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
13. Teachers and students use variety instructional materials														
	P	3	25	4	33	5	41	0	0	0	0	0	0	12
	T	4	33	3	25	4	33	1	8	0	0	0	0	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24

Table 10 (continued)

Participants Ratings: Components of the Intructional Program - Materials and Media

Small Size Schools

14. Career exploration and development materials available													
	P	3	25	4	33	4	33	1	8	0	0	0	0	12
	T	0	0	2	17	7	58	3	25	0	0	0	0	12
	S	8	33	11	45	2	8	1	4	2	8	0	0	24
15. Suitable methods used for materials ordering, keeping inventory, materials/media														
	P	3	25	6	50	3	25	0	0	0	0	0	0	12
	T	2	17	3	25	6	50	0	0	1	8	0	0	12
	S	3	12	13	54	7	29	1	4	0	0	0	0	24
16. Annual budget available for consumable supplies, resource/materials														
	P	2	17	3	25	4	33	1	8	2	17	0	0	12
	T	0	0	3	25	4	33	4	33	1	8	0	0	12
	S	3	12	7	29	7	29	5	20	1	4	1	4	24

17. Adequate storage provision for materials and media														
	P	3	25	5	41	1	8	1	8	2	17	0	0	12
	T	1	8	2	17	5	41	2	17	2	17	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Materials and Media for Each of the Three Groups

Table 10 presents data in the form of a frequency and percentage for each of the 17 statements directed at the materials and media that can be used to support instruction in industrial arts.

Principals = 12

The combined percentages for the 17 criteria that were comprised show that two of these criteria received a combined percentage for placement in the "High" category, between 74 and 100%. There two criteria, 10 and 15 had a combined percent of 75. Between these two extremes were the following criteria and their combined percents in rank order: 8, 12, 17 (66%); 3, 6, 9, 11, 13, 14 (58%); 2, 7 (50%); 4, 5, 16 (42%); 1 (33%). The combined percent for each criterion fell within the 25 to 74% range which placed each in the "Adequate" category.

Teachers = 12

Of the 17 descriptive criteria, the 12 Industrial Arts teachers rated criterion 12 (91%) for placement in the "High" category. This criterion dealt with the availability of audio-visual materials for teacher use. Eleven of the 17 criteria were rated either 5, Excellent or 4, Good with combined percentages that ranged from a low of 25 to a high of 67%. Combined percentages that fell within the range of 25 to 74% were automatically categorized as "Adequate." These criteria in rank order of their combined percentages were: 9 (67%); 7, 13 (58%); 15 (42%); 10 (50%); 6, 8 (41%); 11 (33%); and 5, 16, 17 (25%). The remaining five criteria were rated either 2, Insufficient or 1. There is none, placing criteria 2, 3, 14 (17%); 1 (8%); and 4 (0%) in the "Low" category. These criteria deal with the availability of a wide range of reading and career exploration materials that students can use and the materials and media for students with different ability levels.

Students = 24

There were five of the 17 criteria that the 24 students rated either 5 or 4 which resulted in a combined percent between 75 and 100 placing these criteria in the "High" category. These criteria were: 1, 12 (87%); and 3, 8, 14 (78%). All remaining criteria with percentages from 25 to 74 were placed in the "Adequate" category. These criteria with their combined percentages were: 7, 9, (74%); 4, 10, 15 (66%); 3, 13, (61%); 6, 17 (57%); 11 (46%); 16 (42%); and 5 (41%).

The above date show there was a wide discrepancy between the ratings of the teachers and the other two groups toward the media and materials that were available to support Industrial Arts instruction. The teachers by their ratings indicated that print instructional materials were lacking which the other two groups took the opposite position. Student and principal ratings indicated that they were satisfied with the print and non-print media that their schools had to support Industrial Arts instruction.

Table 11

Participants Ratings: Components of the Instruction Program - Material and Media (Evaluation)

Small Size Schools Evaluation

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate scope of instructional materials and media														
	P	2	17	4	33	4	33	0	0	2	17	0	0	12
	T	0	0	1	8	8	66	3	25	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
2. Adequate quality of instructional materials and media														
	P	2	17	4	33	4	33	1	8	1	8	0	0	12
	T	0	0	3	25	5	41	4	33	0	0	0	0	12
	S	5	20	10	41	5	20	1	4	3	12	0	0	24

3. Adequate quantity of instructional materials and media														
	P	3	25	2	17	4	33	3	25	0	0	0	0	12
	T	0	0	3	25	5	41	3	25	1	8	0	0	12
	S	8	33	11	45	2	8	1	4	2	8	0	0	24
4. Instructional materials accessible to students, teachers														
	P	2	17	6	50	2	17	2	17	0	0	0	0	12
	T	0	0	4	33	5	41	3	25	0	0	0	0	12
	S	3	12	13	54	7	29	1	4	0	0	0	0	24
5. Instructional materials well-organized, maintained														
	P	0	0	4	33	7	58	1	8	0	0	0	0	12
	T	1	8	6	50	4	33	1	8	0	0	0	0	12
	S	3	12	7	29	7	29	5	20	1	4	1	4	24
6. Instructional materials used by faculty and students														
	P	1	8	7	58	2	17	2	17	0	0	0	0	12
	T	2	17	4	33	5	41	1	8	0	0	0	0	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24

Table 11 (continued)

Participants Ratings: Components of the Instruction Program - Material and Media (Evaluation)

Small Size Schools Evaluation

7. Provision for storage of instructional materials													
	P	1	8	7	58	2	17	2	17	0	0	0	0	12
	T	1	8	3	25	4	33	2	17	2	17	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Materials and Media (Evaluation)

To evaluate the instructional materials and the media that were available in participating schools, members of the Self-Evaluating Committees were asked to rate seven evaluation statements. The data collected with these statements were used to organize Table 11. In this table is a frequency for each group and the rating, in the form a percentage that each group gave a statement.

Principals = 12

In Table 11 are data which show that the 12 principals rated all seven statements either 5 or 4 with combined percentages that ranged from a low of 33% to a high of 67%. Combined percentages that ranged from 25% to 74% were placed in the "Adequate" category. These seven statements were placed in that category. In rank order the combined percent for these statements was: 4, (67%); 6, 7 (66%); 1, 2, (50%); 3, (42%); and 5, (33%).

Teachers = 12

The 12 Industrial Arts teachers rated six of the seven statements either "Excellent" or "Good." The combined percentages for these six statements ranged from 25 to 58% categorizing them as "Adequate." A rank order for these statements with a combined percent for each follows: 5 (58%);

6 (50%); 1, 4, 7 (33%); and 2, 3, (25%). The remaining statement was rated by 1 of the 12 teachers placing it in the "Low" category with a rating of 3, "Moderate" or "Enough."

Students = 24

Of the seven evaluation statements, 1 (87%) and 3 (78%) because of the 5 or 4 rating and their respective combined percent which fell within the 75 to 100% range were placed in the "High" category. The remaining five statements were all rated "Excellent" or "Good" but when a combined percent was compiled for each statement, it fell within the "Adequate" category which was a percent between 25 and 74. These statements and their respective percentages in rank order were: 7 (74%); 4, (66%); 2 (61%); 6 (57%); and 5(41%).

An analysis of these data show that the student group as a result of their ratings placed two statements in the "High" category. Neither the principals nor the teachers place any statement in that category. The ratings with resultant combined percentages given to the evaluation statements by the student group were higher than those of the other two groups. The teacher group combined percentages were lower than either the principal group or the student group.

Table 12

Participants Ratings: Components of the Instructional - Program Student Assessment and Program Evaluation

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Student assessment is an integral part of instruction														
	P	5	41	6	50	1	8	0	0	0	0	0	0	12
	T	4	33	6	50	2	17	0	0	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
2. Student assessment provided for individual differences														
	P	3	25	8	66	0	0	1	8	0	0	0	0	12
	T	3	25	5	41	2	17	2	17	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24

3. Results of students assessment reported
to Students, teachers, parents

P	3	25	4	33	4	33	1	8	0	0	0	0	12
T	3	25	3	25	4	33	2	17	0	0	0	0	12
S	10	41	8	33	3	12	2	8	1	4	0	0	24

4. Student assessment results used for:

a.- diagnosing students' learning
styles, knowledge/skills levels

P	3	25	7	58	2	17	0	0	0	0	0	0	12
T	4	33	2	17	4	33	2	17	0	0	0	0	12
S	5	20	10	41	5	20	1	4	3	12	0	0	24

b.- determining students' achievement levels

P	4	33	4	33	4	33	0	0	0	0	0	0	12
T	4	33	4	33	3	25	1	8	0	0	0	0	12
S	8	33	11	45	2	8	1	4	2	8	0	0	24

c.- assessing students' strengths and weaknesses

P	3	25	3	25	6	50	0	0	0	0	0	0	12
T	5	41	5	41	1	8	1	8	0	0	0	0	12
S	3	12	13	54	7	29	1	4	0	0	0	0	24

Table 12 (continued)

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Small Size Schools

d.- determining students' abilities in problem solving													
P	4	33	3	25	4	33	1	8	0	0	0	0	12
T	4	33	3	25	4	33	1	8	0	0	0	0	12
S	3	12	7	29	7	29	5	20	1	4	1	4	24
e.- counseling students													
P	3	25	3	25	6	50	0	0	0	0	0	0	12
T	2	17	3	25	5	41	2	17	0	0	0	0	12
S	5	20	9	37	7	29	1	4	2	8	0	0	24
5. Continuous program evaluation used to determine program goals													
P	2	17	7	58	2	17	1	8	0	0	0	0	12
T	1	8	6	50	3	25	2	17	0	0	0	0	12
S	5	20	9	37	7	29	1	4	2	8	0	0	24
6. Variety of measurement formats used to match students' characteristics, courses objectives													
P	2	17	6	50	3	25	0	0	1	8	0	0	12
T	1	8	7	58	2	17	2	17	0	0	0	0	12
S	4	33	11	45	4	17	5	20	0	0	0	0	24

7. Program outcomes and student performance measured on appropriate data													
	P	1	8	5	41	5	41	0	0	1	8	0	0	12
	T	0	0	2	17	7	58	2	17	1	8	0	0	12
	S	10	41	8	33	3	12	2	8	1	4	0	0	24
8. Program evaluation results used to determine teacher, program effectiveness													
	P	1	8	5	41	5	41	1	8	0	0	0	0	12
	T	0	0	3	25	6	50	2	17	1	8	0	0	12
	S	3	12	13	54	5	20	2	8	1	4	0	0	24
9. Program evaluation results used for making program changes													
	P	2	17	6	50	3	25	1	8	0	0	0	0	12
	T	2	17	9	75	0	0	1	8	0	0	0	0	12
	S	4	17	7	29	7	29	5	20	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Student Assessment and Program Evaluation

Participants in rating the criteria for this section of the instrument had a total of nine criteria to rate which included thirteen statements because criterion 4, had 5 subsections. The ratings given to each criterion with frequencies and combined percentages were used to organize the data found in Table 12.

Principals = 12

Of the thirteen criterion the principals from small size schools involved in the research by their 5 or 4 rating placed criterion 1, 2 (91%), 4 (83%) and 5 (75%) in the "High" category. The following is a rank order for each criterion with its accompanying combined percent that was categorized as "Adequate": 6, 9 (67%), 4b (66%), 3, 4d (58%), 4c, 4e (58%) and 7, 8 (49%).

Teachers = 12

The 12 industrial art teachers from participating small schools as a result of their rating the 13 criteria placed criterion 7 with a combined percent of 17 in the "Low" category; criteria 9 (92%), 1 (83%), 4c (82%) in the "High" category; and the remaining nine criteria in the "Adequate" category. The combined percent for each criterion placed in the latter category follow: 2, 4b, 6 (66%), 4d, 5 (58%), 3, 4 (50%), 4e (42%) and 8 (25%).

Students = 24

Student members who served on the Self-Evaluation Committees for small size schools by their ratings and resultant combined percentages to the 13 descriptive criteria placed criteria 1 (92%), 2 (87%) and 4b, 6 (78%) in the "High" category. The remaining nine criteria as a result of a rating of 5 or 4 and a combined percent between 25 and 74 were categorized as "Adequate." These nine criteria by combined percent in rank order were: 7 (74%), 4c, 8 (66%), 4a (61%), 4e, 5 (57%), 9 (46%), 3 (43%) and 4d (41%).

It is evident from the above analysis that both the principals and the students placed an equal number of criteria, four, in the "High" category. Although the number of criteria were equal each group placed different criteria in that category. The teacher group placed criterion 7 in the "Low" category. That criterion had to deal with the measurement of student performance based on appropriate data in relation to program outcomes.

Suggestions on Student Assessment and Program Evaluation

Principals

- Seven principals were concerned that too much emphasis was placed by the industrial arts teachers and the students on the industrial arts products the students made, with little attention being given to the processes, attitudes, and safety practices the student should acquire in the industrial arts shop.

- Five principals suggested that the Department of General Education provide secondary schools with a sample of an acceptable industrial arts program of study one that shows a combination of the different industrial arts courses and other required courses for the secondary schools to use as a guide.

- Five principals felt that industrial arts teachers in their schools lacked standard criteria they could use to evaluate the students' achievement in industrial arts courses, especially those concern with the development of skills in the three learning domains.

- Three principals suggested that an in-service training being organized by the Department of General Education to prepare industrial arts teachers with the necessary competencies to evaluate the achievement of industrial arts students'.

- Three principals made the suggestion that industrial arts teachers who taught in their schools include in their evaluation the students' housekeeping habits as they relate to the school shop and considered this as part of students' achievement in industrial arts.

Teachers

- Ten industrial arts teachers did not agree with their school administrative committees that additional emphasis be placed on theoretical pencil and paper-tests for industrial arts subjects. These industrial arts teachers suggested that additional attention be given to the practical aspects of industrial arts when evaluating students.

- Six industrial arts teachers felt that the school administrators placed too much emphasis on the material value of the industrial arts project than they did on the educational value the student acquired in making the project. What the materials does to the learner not what the learner does to the material.

- Four industrial arts teachers suggested that: safety practices of the student while in a school shop be evaluated as a part of students' achievement for industrial arts.

Students

- Eight industrial arts students believed that the instructional time allocated for industrial arts courses was insufficient for the students to achieve the objectives established for industrial arts courses.

- Six industrial arts students by their suggestions indicated they wished that the administrators of their school would evaluate how well the industrial arts teachers were doing their jobs.

- Six students indicated that too much emphasis was placed on the products rather than on the processes, the students' attitudes, and the safety practices that result from the student making the product.

- Three industrial arts students felt that the evaluation of student achievement in industrial arts was very subjective and that some teachers were biased when marking projects.

Table 13

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional areas close to related instructional areas														
	P	6	50	4	33	2	17	0	0	0	0	0	0	12
	T	4	33	6	50	0	0	1	8	1	8	0	0	12
	S	5	20	8	33	10	41	1	4	0	0	0	0	24
2. Appropriate spaces provision for variety instructional activities														
	P	6	50	2	17	2	17	1	8	1	8	0	0	12
	T	1	8	6	50	2	17	2	17	1	8	0	0	12
	S	5	20	7	29	5	20	5	20	2	8	0	0	24

3. Laboratory floor area meets acceptable standards for instructional activities													
	P	4	33	4	33	3	25	0	0	1	8	0	0	12
	T	1	8	6	50	2	17	1	8	1	8	1	8	12
	S	1	4	10	41	9	37	4	17	0	0	0	0	24
4. Adequate lavatory facilities for both sexes provided in close proximity													
	P	5	41	4	33	3	25	0	0	0	0	0	0	12
	T	2	17	3	25	2	17	2	17	2	17	1	8	12
	S	4	17	2	8	12	50	5	20	1	4	0	0	24
5. Adequate office space for each teacher													
	P	2	17	3	25	6	50	0	0	1	8	0	0	12
	T	2	17	2	17	2	17	3	25	1	8	2	17	12
	S	6	25	8	33	7	29	2	8	1	4	0	0	24
6. Adequate demonstration and discussion area provided													
	P	3	25	3	25	2	17	2	17	1	8	1	8	12
	T	3	25	3	25	5	41	1	8	0	0	0	0	12
	S	0	0	7	29	10	41	6	25	1	4	0	0	24
7. Ceiling height appropriate for activities being conducted													
	P	3	25	6	50	2	17	1	8	0	0	0	0	12
	T	3	25	4	33	1	8	2	17	1	8	1	8	12
	S	6	25	7	29	9	37	2	8	0	0	0	0	24

Table 13 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Small Size Schools

8. Instructional areas have provision for adequate heat, light, ventilation, acoustics control													
P	3	25	3	25	5	41	0	0	1	8	0	0	12
T	1	8	5	41	2	17	2	17	2	17	0	0	12
S	2	8	5	20	9	37	5	20	3	25	0	0	24
9. Proper exhaust equipment provided													
P	1	8	1	8	2	17	3	25	2	17	3	25	12
T	0	0	0	0	1	8	2	17	6	50	3	25	12
S	1	4	1	4	5	20	4	17	9	37	4	17	24
10. Appropriate utilities provided in instructional areas													
P	1	8	4	33	3	25	2	17	1	8	1	8	12
T	0	0	2	17	3	25	3	25	3	25	1	8	12
S	2	8	3	12	10	41	6	25	3	12	0	0	24
11. The instructional areas meet all safety regulations													
P	1	8	8	66	2	17	1	8	0	0	0	0	12
T	1	8	3	25	4	33	3	25	1	8	0	0	12
S	1	4	8	33	9	37	5	20	0	0	1	4	24

12. Safety barriers, zones, and aisles are properly marked											
P	3	25	2	17	5	41	1	8	1	8	0	0	12
T	0	0	2	17	3	25	3	25	2	17	2	17	12
S	3	12	6	25	5	20	6	25	1	4	3	12	24
13. Instructional area floors kept free of waste materials grease, obstructions													
P	1	8	9	75	1	8	1	8	0	0	0	0	12
T	1	8	4	33	3	25	2	17	2	17	0	0	12
S	3	12	11	45	5	20	3	12	2	8	0	0	24
14. Non-skid surface on floors and on machine-operated work areas													
P	2	17	7	58	2	17	1	8	0	0	0	0	12
T	0	0	1	8	5	41	4	33	1	8	1	8	12
S	2	8	9	37	8	33	1	4	4	17	0	0	24
15. Emergency disconnect switch for power equipment easily accessible													
P	1	8	7	58	2	17	1	8	0	0	1	8	12
T	2	17	4	33	3	25	2	17	0	0	1	8	12
S	5	20	9	37	5	20	3	12	2	8	0	0	24

Table 13 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Small Size Schools

16. Fire extinguishers of correct class provided in appropriate locations												
	P	4	33	5	41	1	8	1	8	0	0	1	8	12
	T	2	17	2	17	3	25	3	25	1	8	1	8	12
	S	3	12	4	17	10	41	1	4	5	20	1	4	24
17. A first-aid kit, related emergency supplies provided according to regulations														
	P	1	8	3	25	3	25	3	25	1	8	1	8	12
	T	0	0	0	0	2	17	2	17	6	50	2	17	12
	S	0	0	3	12	3	12	7	29	7	29	4	17	24
18. Color-coding schemes for safety purposes used throughout the laboratory														
	P	1	8	3	25	5	41	2	17	0	0	1	8	12
	T	0	0	0	0	2	17	6	50	3	25	1	8	12
	S	0	0	6	25	12	50	4	17	2	8	0	0	24
19. Lockable master switch boxes located in each laboratory														
	P	3	25	4	33	2	17	2	17	0	0	1	8	12
	T	2	17	3	25	3	25	2	17	1	8	1	8	12
	S	5	20	9	37	7	29	1	4	2	8	0	0	24

20. Adequate, safe, secure storage for supplies, equipment provided														
	P	3	25	3	25	4	33	0	0	1	8	1	8	12
	T	1	8	3	25	3	25	4	33	1	8	0	0	12
	S	1	4	13	54	7	29	3	12	0	0	0	0	24
21. Adequate storage for individual and group projects														
	P	2	17	2	17	3	25	3	25	1	8	1	8	12
	T	0	0	1	8	2	17	5	41	3	25	1	8	12
	S	1	4	7	29	6	25	7	29	3	12	0	0	24
22. Sufficient size display cases, properly located provision														
	P	2	17	2	17	2	17	3	25	2	17	1	8	12
	T	0	0	1	8	1	8	6	50	2	17	2	17	12
	S	1	4	2	8	8	33	8	33	3	12	2	8	24
23. Appropriate storage lockers are provided for students														
	P	0	0	1	8	4	33	3	25	2	17	2	17	12
	T	0	0	0	0	0	0	2	17	8	66	2	17	12
	S	0	0	1	4	6	25	8	33	7	29	2	8	24

Table 13 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Small Size Schools

24. Radioactive, flammable, corrosive materials are stored safely

P	2	17	0	0	4	33	2	17	2	17	2	17	12
T	0	0	1	8	2	17	4	33	4	33	1	8	12
S	1	4	6	25	8	33	5	20	3	12	1	4	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Facilities and Equipment (Facilities)

There were 24 descriptive criteria that members of the Self-Evaluation Committees in small-size school were to rate using a five-point scale. The ratings that each group gave to each of these criteria were used to organize Table 13.

Principals = 12

Of the 24 criteria the 12 principals rated 17 criteria "Adequate," 4 "High," and 3 "Low." The "Adequate" criteria had a combined percent that ranged from 25 to 74%, "High" criteria percent ranged from 75 to 100% and low from 0 to 24%. A rank order for the "Adequate" criteria according to combined percent: 4, 11, 16 (74%); 2 (67%); 3, 15 (66%); 19 (58%); 6, 8, 20 (50%); 5, 12, (42%); 10 (41%); 21, 34 (34%); and 17, 18 (33%). For the "High" category: 1, 13 (83%) and 7, 14 (75%); the "Low" category: 9 (16%); 24 (17%) and 23 (8%).

Teachers = 12

Data in Table 13 show that the 12 Industrial Arts teachers by their ratings to the 24 descriptive criteria for facilities and equipment with resultant combined percentages show that 13 of the 24 criteria were placed in the "Adequate" category; 10 in the "Low" category; and one in the "High" category. A rank order for each criterion by combined percent for each category follow: "Adequate": 2, 3, 7, (50%); 6, 15 (50%); 8 (49%); 4, 19 (42%); 13 (41%) 5, 16 (34%); 11, 20 (33%); "Low": 10, 12 (17%); 14, 21, 22, 24 (8%); 9, 17, 18, 24 (0%); "High": 1 (83%)

Students = 24

From an analysis of data in Table 13 it should be evident that the students had 19 criteria categorized as "Adequate" with the remaining 5 criteria placed in the "Low category. These criteria were placed in these categories as a result of their combined percent. In rank order criterion by combined percent for each category were: "Adequate": 5, 20 (58%); 13, 15, 19 (57%); 7 (54%); 1 (53%); 2 (49%); 3, 8, 14 (45%); 11, 12 (37%); 21 (33%); 6, 16, 24 (29%); and 4, 18 (25%); "Low": 1 (20%); 22 (12%); 9 (8%); 23 (4%); and 17 (37%).

The above analysis show that the teacher's perception of the learning environment where they taught differed from the perceptions that the other two groups had toward that environment; its equipment and structure. Although all three groups considered that environment adequate for teaching Industrial Arts, there were some areas that needed to be improved. Among these were: the installation of a proper exhaust system; the installation of appropriate utilities to support instruction; the purchase of and installation of first aid and other emergency equipment; providing appropriate storage lockers for student use; and space for the storage of flammable and corrosive materials.

Table 14

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Variety of equipment and supplies available														
	P	1	8	3	25	6	50	2	17	0	0	0	0	12
	T	0	0	3	25	6	50	3	25	0	0	0	0	12
	S	3	12	7	29	10	41	3	12	1	4	0	0	24
2. Appropriate audiovisual equipment available														
	P	2	17	1	8	6	50	3	25	0	0	0	0	12
	T	1	8	0	0	3	25	6	50	2	17	0	0	12
	S	1	4	7	29	11	45	2	8	3	12	0	0	24

3. Adequate chalkboards, bulletin boards provision													
	P	2	17	4	33	5	41	1	8	0	0	0	0	12
	T	1	8	1	8	8	66	1	8	1	8	0	0	12
	S	3	12	8	33	10	41	3	12	0	0	0	0	24
4. Adequate supplies, equipment available for instruction														
	P	1	8	2	17	6	50	3	25	0	0	0	0	12
	T	0	0	3	25	6	50	3	25	0	0	0	0	12
	S	0	0	10	41	11	45	3	12	0	0	0	0	24
5. Well-maintained equipment, meeting safety requirements														
	P	3	25	3	25	5	41	1	8	0	0	0	0	12
	T	1	8	4	33	6	50	1	8	0	0	0	0	12
	S	1	4	9	37	11	45	2	8	1	4	0	0	24
6. Safety guards remain in place, except when the equipment is under repair														
	P	0	0	5	41	5	41	1	8	0	0	1	8	12
	T	0	0	2	17	4	33	4	33	1	8	1	8	12
	S	0	0	8	33	13	54	2	8	1	4	0	0	24
7. All machine tools are provided with safety guards														
	P	1	8	6	50	3	25	1	8	0	0	1	8	12
	T	0	0	3	25	4	33	4	33	1	8	0	0	12
	S	0	0	8	33	12	50	2	8	2	8	0	0	24

Table 14 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Small Size Schools

8. Unsafe instrument being removed from service, visibly marked														
	P	3	25	5	41	2	17	1	8	0	0	1	8	12
	T	2	17	1	8	5	41	2	17	2	17	0	0	12
	S	6	25	9	37	7	29	2	8	0	0	0	0	24
9. Magnetic control switches, braking devices provision for appropriate machines														
	P	0	0	7	58	1	8	1	8	1	8	2	17	12
	T	0	0	4	33	4	33	1	8	1	8	2	17	12
	S	3	12	8	33	10	41	0	0	1	4	0	0	24
10. Eye protection devices provided for persons exposed to eye injury conditions														
	P	2	17	7	58	2	17	0	0	1	8	0	0	12
	T	2	17	2	17	6	50	1	8	1	8	0	0	12
	S	6	25	7	29	5	20	4	17	2	8	0	0	24
11. Ear protection provided for persons exposed to ear damage conditions														
	P	0	0	2	17	6	50	0	0	2	17	2	17	12
	T	0	0	1	8	0	0	4	33	5	41	2	17	12
	S	0	0	2	8	7	29	7	29	7	29	1	4	24

12. Respiratory protection devices provision														
	P	0	0	2	17	2	17	4	33	2	17	2	17	12
	T	0	0	0	0	0	0	4	33	3	25	5	41	12
	S	0	0	3	12	9	37	4	17	5	20	1	4	24
13. Head protection devices provision														
	P	0	0	1	8	4	33	3	25	2	17	2	17	12
	T	0	0	0	0	0	0	4	33	5	41	3	25	12
	S	1	4	2	9	6	26	9	43	3	13	1	4	22
14. Appropriate clothing worn by teachers and students when exposed to conditions warrant														
	P	1	8	2	17	3	25	3	25	2	17	1	8	12
	T	0	0	1	8	5	41	2	17	2	17	2	17	12
	S	0	0	5	20	5	20	9	37	5	20	0	0	24
15. Personal protection devices sanitized after each use														
	P	1	8	2	17	5	41	2	17	1	8	1	8	12
	T	0	0	4	33	7	58	1	8	0	0	0	0	12
	S	2	8	6	25	6	25	6	25	4	17	0	0	24
16. Corrective, preventive maintenance performed within reasonable time														
	P	1	8	3	25	5	41	1	8	0	0	2	17	12
	T	1	8	3	25	5	41	3	25	0	0	0	0	12
	S	2	8	3	12	12	50	4	17	3	12	0	0	24

Table 14 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Small Size Schools

17. Appropriate furniture for instruction provision													
P	1	8	5	41	4	33	1	8	1	8	0	0	12
T	0	0	3	25	5	41	3	25	1	8	0	0	12
S	0	0	13	54	7	29	3	12	1	4	0	0	24
18. Machines placed, mounted in safe, functional manner													
P	3	25	5	41	3	25	1	8	0	0	0	0	12
T	2	17	4	33	3	25	2	17	0	0	1	8	12
S	3	12	11	45	6	50	2	8	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

In Table 14 are data which present a frequency and a percentage for each of the 18 statements directed at facilities and equipment (supplies and equipment) that were available for the Industrial Arts programs in the 12 small-size participating schools.

Principals = 12

Data from the above Table show that the 12 principals, as a result of their rating to the 18 criteria of either 5 "Excellent" or 4 "Good" with a combined percent that ranged between 25 and 74%, had 14 of the criteria placed in the "Adequate" category and three in the "Low" category with percentages that ranged between 0 and 24%. This group had one criterion; criterion 10 placed in the "High" category which required a percent that ranged between 75 and 100%. Criterion and their related combined percent had this rank order "Adequate": 8, 18 (66%); 7, 9 (58%); 3, 5, (50%); 17 (49%); 6 (41%) 1, 16 (33%); 2, 4, 14, 15 (25%); "Low": 11, 12 (17%); 13 (8%); "High": 10 (75%).

Teachers = 12

As a result of their rating and combining percentages for the 18 criteria by the 12 Industrial Arts teachers, 11 criteria were categorized "Adequate," seven "High" and none

"Low." The criteria categorized as "Adequate" had combined percentages that ranged from 25 to 50%. A rank order for these criteria by combined percentage follow: 18 (50%); 5 (41%); 40 (33%); 9, 15, 16 (32%); and 1, 4, 7, 8, 17 (25%). Descriptive criteria that were placed in the "Low" category with accompanying percent for each criterion included: 3 (16%); 2, 11, 14 (82%); and 12, 13 (0%). This group failed to place any criterion in the "High" category.

Students = 24

In the 12 small-size schools that had their Industrial Arts program evaluated, there were two students from each school who served on the Self-Evaluation Committee. How these students rated the 18 criteria that dealt with supplies and equipment of these programs are data that are found in Table 14. These data show that of the 18 criteria, 13 were rated either 5 "Excellent" or 4 "Good," with combined percentages that ranged from a low of 33% to a high of 62%. Placed in rank order by criterion these 13 criteria were: 8 (62%); 18 (57%); 10, 17 (54%); 3, 9, (45%) 1, 4, 5 (41%); and 2, 6, 7, 15 (33%). Criteria 14, 16 (20%) 13 (13%); 12 (12%) and 11 (8%). Because the combined percent of each criterion fell between the 0 to 24% range they were categorized as "Low."

From an analysis of the above data, it is evident that the principals had the largest number of criteria categorized as "Adequate." They were followed by the students, with the teachers placing the least number of criteria in that category. The reverse is true for criteria placed in the "Low" category. The teachers placed the largest number of criteria in the "Low" category, followed by the students who were followed by the principals. The latter groups' perception of the supplies and equipment in their school's Industrial Arts learning environment maybe clouded by what they see and tighten the purse strings to the determent of expendable supplies required for instructional purposes. These are the people who have control over the allocation of finances in their schools for the purchase of supplies and equipment.

All three groups rated personal safety items "Low." The requisitioning of this equipment is the responsibility of the teacher. The supervisor of Industrial Arts, Department of General Education is also responsible, because of position and authority, to recommend the type of personal safety equipment to purchase to establish a safe working environment for the learner. In this case both these individuals shirked the responsibility to see that this equipment was in place.

Table 15

Participants Ratings: Components of the Instructional Program: Supplies and Equipment (Evaluation)

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Facilities, equipment conducive to objectives achievement														
	P	1	8	8	66	2	17	1	8	0	0	0	0	12
	T	1	8	5	41	5	41	1	8	0	0	0	0	12
	S	1	4	10	41	7	29	4	17	2	8	0	0	24
2. Adequate instructional space provided														
	P	1	8	5	41	3	25	3	25	0	0	0	0	12
	T	0	0	4	33	7	58	0	0	1	8	0	0	12
	S	1	4	7	29	11	45	4	17	1	4	0	0	24

3. Adequate instructional equipment, facilities provided													
	P	2	17	1	8	7	58	2	17	0	0	0	0	12
	T	0	0	3	25	5	41	3	25	1	8	0	0	12
	S	0	0	5	20	10	41	7	29	2	8	0	0	24
4. Facilities, equipment effectively used for instructional activities														
	P	1	8	5	41	6	50	0	0	0	0	0	0	12
	T	1	8	4	33	4	33	2	17	1	8	0	0	12
	S	1	4	8	33	10	41	3	12	2	8	0	0	24
5. Adequate storage facilities for supplies, equipment														
	P	1	8	6	66	4	33	1	8	0	0	0	0	12
	T	1	8	2	17	6	50	2	17	1	8	0	0	12
	S	1	4	6	25	14	58	2	8	1	4	0	0	24
6. Equipment well-maintained for efficient use														
	P	1	8	7	58	4	33	0	0	0	0	0	0	12
	T	0	0	5	41	7	58	0	0	0	0	0	0	12
	S	1	4	10	41	6	25	6	25	1	4	0	0	24

Table 15 (continued)

Participants Ratings: Components of the Industrial Program: Supplies and Equipment (Evaluation)

Small Size Schools

7. Laboratories maintained adequately

P	1	8	6	50	4	33	1	8	0	0	0	0	12
T	0	0	5	41	5	41	2	17	0	0	0	0	12
S	3	12	7	29	7	29	7	29	0	0	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program

Supplies and Equipment (Evaluation)

To evaluate the supplies and equipment that were part of the Industrial Arts instructional program, participants were asked to rate seven evaluation statements using the five point rating scale. The data collected with these statements are found as frequencies and percentages in Table 15.

Principals = 12

The ratings give to these statements by the 12 principals from small-size schools show that they rated all seven statements either 5 "Excellent" or 4 "Good" which placed these statements in the "Adequate" category. The combined percentages for these statements ranged from 25 to 74%. Placed in rank order according to combined percent these statements were: 1, 5 (74%); 6 (66%); 7 (58%); 2, 4 (49%) and 3 (25%).

Teachers = 12

Similar to the principals, the 12 Industrial Arts teachers of the Self-Evaluation Committees also rated all seven statements either 5 or 4 which categorized them as "Adequate." These statements in rank order by combined percent were: 1 (49%), 4, 6, 7 (41%) 2 (33%) and 3, 5 (25%).

Students = 24

As a result of their ratings to the seven evaluation statements, the 24 Industrial Arts students had six of the seven statements categorized as "Adequate" and one as "Low." Statements considered to be "Adequate" were: 1, 6 (45%); 7 (41%); 4 (37%); 2 (33%); and 5 (29%). Statement 3 had a percent of 20. The percentage range for placement in the "Low" category was 0 - 24.

From an analysis of these data it is evident that the percent of participants from the three groups who rated a statement varied except for the statement that dealt with the adequacy on instructional equipment and facilities that were available. By their ratings, the students consider that both the equipment and the facilities to be inadequate for teaching Industrial Arts. The ratings of the other two groups show agreement with the students. The ratings with resultant percentages of the principals which were highest indicate the perceptions of this group varied significantly from the other two groups.

Components of the Instructional Program:
Suggestions on Supplies and Equipment (Evaluation)

Principals

- There were ten principals who reported that there was not enough supporting budget given to the schools by the

Ministry of Education for the Industrial Arts program in their schools.

- There were eight principals who suggested that the Ministry of Education provide the secondary schools with national standards for facilities and equipment for Industrial Arts shops; that would provide a laboratory that was properly laid-out and well-equipped as a learning environment where students can acquire the necessary competencies.

- Seven principals felt that industrial arts facilities that were available in their school shops had been in place the past 15 years, and not been renovated during that time. As a consequence they were obsolete and in poor condition and needed to be replaced.

- Three principals stated that the industrial arts facilities that were available and the instructional activities taught did not correlate with the curriculum or the objectives for the current industrial arts courses

- Three principals by their suggestions stressed that in addition to industrial arts facilities that were inadequate in their schools, there also existed a shortage of well-qualified industrial arts staff who could teach some of the areas.

Teachers

- Five industrial arts teachers viewed the industrial arts facilities and equipment provided by the Department of

General Education to their schools as antiques that were inappropriate for today's high technology society. These teachers found that this equipment created a burden for a school to maintain.

- Four industrial arts teachers recommended that the Department of General Education conduct an equipment-need assessment for industrial arts equipment that a school may require prior to providing any equipment to a school.

- Three industrial arts teachers pointed out that each individual school has its own unique needs and problems; thus, the Department of General Education should take this into consideration before providing facilities to that school.

Student

- There were ten students commented that industrial arts shops in their schools were not well-equipped. These students wished there was more working space in a shop, ideally, with tools, equipment, materials, first aid kits, and storage rooms.

- There were six students who suggested that their schools provide the students with lockers in which to keep materials and personal belongings while working in the shop.

- Three students felt that the facilities and equipment in their shops were not as up-to-date as the equipment found in industry.

- Two students wished that the school would provide adequate personal safety protection devices for all industrial arts students.

Table 16

Participants Ratings: Learning Climate

Small Size Schools

N = P 12
T 12
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Objectives reflect a clear sense of purpose														
	P	2	17	8	66	2	17	0	0	0	0	0	0	12
	T	1	8	6	50	5	41	0	0	0	0	0	0	12
	S	1	4	16	66	5	20	2	8	0	0	0	0	24
2. Competent, dedicated faculty														
	P	2	17	8	66	2	17	0	0	0	0	0	0	12
	T	3	25	4	33	5	41	0	0	0	0	0	0	12
	S	7	29	9	37	7	29	0	0	1	4	0	0	24

3. School administration provides adequate resources, encouragement

P	2	17	7	58	3	25	0	0	0	0	0	0	12
T	0	0	3	25	6	50	3	25	0	0	0	0	12
S	3	1	9	37	6	25	4	17	2	8	0	0	24

4. High student achievement expected by administration and staff

P	2	17	7	58	3	25	0	0	0	0	0	0	12
T	3	25	6	50	3	25	0	0	0	0	0	0	12
S	6	25	9	37	8	33	1	4	0	0	0	0	24

5. Parents, community support exists for program

P	1	8	2	17	6	50	2	17	1	8	0	0	12
T	1	8	5	41	3	25	3	25	0	0	0	0	12
S	3	12	10	41	9	37	2	8	0	0	0	0	24

6. Instructional program based on appropriate diagnosis of students' developmental characteristics

P	1	8	6	50	5	41	0	0	0	0	0	0	12
T	1	8	3	25	8	66	0	0	0	0	0	0	12
S	2	8	11	45	8	33	3	12	0	0	0	0	24

Table 16 (continued)

Participants Ratings: Learning Climate

Small Size Schools

7. Student placement predicated on faculty advisement, individual student plans

P	2	17	4	33	5	41	1	8	0	0	0	0	12
T	0	0	4	33	6	50	2	17	0	0	0	0	12
S	8	33	8	33	6	25	2	8	0	0	0	0	24

8. Classroom organization provides for optimum use of instructional time

P	1	8	8	66	3	25	0	0	0	0	0	0	12
T	3	25	5	41	3	25	1	8	0	0	0	0	12
S	6	25	11	45	6	25	1	4	0	0	0	0	24

9. Instructional methods facilitate individual student performance

P	2	17	7	58	3	25	0	0	0	0	0	0	12
T	1	8	9	75	2	17	0	0	0	0	0	0	12
S	4	17	12	50	6	25	1	4	1	4	0	0	24

10. All students are given opportunity to achieve required program and individual goals

P	1	8	9	75	1	8	1	8	0	0	0	0	12
T	1	8	4	33	7	58	0	0	0	0	0	0	12
S	4	17	10	41	10	41	0	0	0	0	0	0	24

11. Frequent feedback on students' performance provided

P	3	25	6	50	3	25	0	0	0	0	0	0	12
T	3	25	7	58	2	17	0	0	0	0	0	0	12
S	6	25	12	50	5	20	1	4	0	0	0	0	24

12. Appriasal of teacher performance oriented toward instructional improvement

P	3	25	6	50	3	25	0	0	0	0	0	0	12
T	1	8	5	41	5	41	1	8	0	0	0	0	12
S	5	20	11	45	6	25	2	8	0	0	0	0	24

13. Students' self-esteem enchanced by positive relationships among peers, teachers

P	2	17	8	66	2	17	0	0	0	0	0	0	12
T	1	8	6	50	5	41	0	0	0	0	0	0	12
S	10	41	7	29	6	25	1	4	0	0	0	0	24

14. School classroom disciplinary standards promote positive learning environment

P	3	25	7	58	2	17	0	0	0	0	0	0	12
T	1	8	8	66	3	25	0	0	0	0	0	0	12
S	3	14	16	76	5	24	0	0	0	0	0	0	24

Table 16 (continued)

Participants Ratings: Learning Climate

Small Size Schools

15. Students, teachers are recognized for achieving program objectives													
	P	3	25	7	58	2	17	0	0	0	0	0	0	12
	T	1	8	5	41	5	41	1	8	0	0	0	0	12
	S	4	12	14	58	5	20	1	4	0	0	0	0	24
16. Facilities are maintianed pleasing, functional, safe and properly													
	P	1	8	7	58	3	25	1	8	0	0	0	0	12
	T	1	8	3	25	6	50	2	17	0	0	0	0	12
	S	2	8	10	41	7	29	3	12	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Learning Climate

To evaluate the Learning Climate where Industrial Arts was taught in the 12 small-size schools, a school with 1 to 9 classrooms, members of the self-evaluation committees were asked to rate 16 criteria. How each of the three groups rated these criteria are data found in Table 16 - Participants Ratings: Learning Climate.

Principals = 12

The 12 principals by their ratings had 10 criteria categorized as "High," 6 "Adequate" and none "Low." Criteria placed in the "High" category were rated either 5 "Excellent" or 4 "Good," and had a combined percent which fell between 75 and 100%. A rank order by combined percent for each "High" criterion follows: 1, 2, 10, 14, 15 (83%); 3, 4, 9, 11, 12 (74%); Criteria placed in the "Adequate" category by combined percent in rank order were: 8, 13 (74%); 16 (64%); 6 (58%); 7 (50%); and 5 (25%).

Teachers = 12

The 12 Industrial Arts teachers from small-size schools who served on the Self-Evaluation Committees by their ratings placed 3 of the 16 Learning Climate criteria in the "High" category and the remaining 13 in the "Adequate" category. For a criterion to be placed in the "High" category the combined percent for that criterion had to lie between 75%

and 100%. For the "Adequate" category, that percent had to fall between 25 and 74%. These criteria 9, 11 (83%) and 4 (75%) were those categorized as "High." Criteria 14 (74%); 8 (66%); 1, 2, 13 (58%); 5, 12, 15 (49%); 10 (41%); 6, 7, 16 (33%); and 3 (25%) were each placed in the "Adequate" category.

Students = 24

The 24 student members of the Self-Evaluation Committees rated two of the 16 criteria either 5 or 4 that had a combined percent that fell within the 75 to 100% range for placement in the "High" category. These criteria were 14 (90%) and 11 (75%). The remaining 14 criteria were also given a rating of 5 or 4 but their combined percentages ranged between 25 and 74% which was the range for placing a criterion in the "Adequate" category. According to percent these 14 criteria were ranked in this order: 1, 8, 13 (70%); 9 (67%); 7 (66%); 12 (65%); 4, 15 (62%); 10 (58%); 5, 6 (53%); 3, 16 (49%); and 2 (44%).

These data show there exists a variance of perception between the principals groups and the other two groups concerning the Learning Climate of the school as it impacts on Industrial Arts. These administrators see Learning Climate from a positive point of view which is idealistically and theoretically based. Both the teachers and the students see the Learning Climate, established for a school, from a practical operational point of view. These views represent the two extremes of the continuum. For example, the principals believe they provide adequate resources and encouragement to the Industrial Arts teachers of their schools. Both the teachers and the students believe the funding and administrative encouragement are both inadequate. Another example is that the administrators view their Industrial Arts teachers as dedicated and competent. Both the teachers and the students considered these teachers to have limited competencies.

Table 17

Participants Ratings: Learning Climate (Evaluation)

Small Size Schools

N = P 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Learning climate support attainment of program objectives														
	P	1	8	8	66	3	25	0	0	0	0	0	0	12
	T	1	8	2	17	9	75	0	0	0	0	0	0	12
	S	0	0	14	58	9	37	1	4	0	0	0	0	24
2. Learning climate foster individual student satisfaction, self-esteem														
	P	1	8	9	75	2	17	0	0	0	0	0	0	12
	T	0	0	5	41	7	58	0	0	0	0	0	0	12
	S	2	8	12	50	9	37	1	4	0	0	0	0	24

3. Learning climate foster individual student achievement

P	2	17	5	41	4	33	1	8	0	0	0	0	12
T	1	8	5	41	6	50	0	0	0	0	0	0	12
S	1	4	13	54	9	37	1	4	0	0	0	0	24

4. Program evaluated, revised regularly to meet content and student needs

P	2	17	8	66	2	17	0	0	0	0	0	0	12
T	1	8	4	33	4	33	2	17	1	8	0	0	12
S	3	12	10	41	9	37	2	8	0	0	0	0	24

5. To what degree do the following groups have a positive perception of learning climate:

a. - students

P	2	17	8	66	2	17	0	0	0	0	0	0	12
T	1	8	6	66	2	22	0	0	0	0	0	0	9
S	4	22	10	55	4	22	0	0	0	0	0	0	18

b. - teachers

P	3	25	6	50	3	25	0	0	0	0	0	0	12
T	2	17	5	41	5	41	0	0	0	0	0	0	12
S	5	20	13	54	4	17	1	4	1	4	0	0	24

c. - parents and community

P	3	25	4	33	3	25	1	8	1	8	0	0	12
T	1	8	5	41	6	50	0	0	0	0	0	0	12
S	5	20	13	54	6	25	0	0	0	0	0	0	24

Table 17 (continued)

Participants Ratings: Learning Climate (Evaluation)

Small Size Schools

d. - school administration														
	P	2	17	6	50	3	25	1	8	0	0	0	0	12
	T	1	8	4	33	6	50	1	8	0	0	0	0	12
	S	2	8	12	50	9	37	1	4	0	0	0	0	24
e. - district administration														
	P	2	17	5	41	3	25	0	0	2	17	0	0	12
	T	0	0	3	25	7	58	1	8	1	8	0	0	12
	S	4	17	12	50	7	29	0	0	1	4	0	0	24
f. - the Ministry of Education														
	P	2	17	6	50	3	25	1	8	0	0	0	0	12
	T	1	8	5	41	4	33	1	8	1	8	0	0	12
	S	3	13	12	54	5	23	1	4	1	4	0	0	22

Percentage total may be less than or greater than 100 because of rounding

P = Principal

T = Industrial Arts Teachers

S = Industrial Arts Students

Learning Climate: Evaluation

To evaluate the Learning Climate for Industrial Arts found in the 12 small-size schools, the participants in this investigation were asked to rate five statements. One of the statements had five sub-statements for a total of ten ratable statements. In Table 17 are data showing the rating and the percent for each group who rated the statement.

Principals = 12

Data in the above Table show that the 12 principals rated half of the ten statements either 5 "Excellent" or 4 "Good." The combined percent resulting from each rating placed the following statements in the "High" category 2, 4 5a (83%); 5c (78%), and 5b (75%). The remaining five statements as a result of their combined percents were categorized as "Adequate." These were statements 1 (74%), 5d 5f (67%) and 3, 5e (58%).

Teachers = 12

The teacher-members of the Self-Evaluation Committees in the 12 small-size schools rated the ten statements either 5 or 4 with percentages that ranged from a low of 25 to a high of 74 which placed all of these statements in the "Adequate" category. In rank order, these statements were 5a (74%), 5b (58%), 3, 5c, 5f (49%), 2, 4, 5d (41%) and 1, 5e (25%).

Students = 24

Data in the above table show that one of the ten evaluation statements received a rating of 5 or 4 by the 24 Industrial Arts students who participated in the study. The combined percent for statement 5a was 77 which placed it in the "High" category. The nine remaining statements were also rated 5 or 4 but their percentages ranged from 53 to 74%. As a result of these percentages, these statements were categorized as "Adequate." A rank order for those nine statements by combined percent follows: 5b, 5c (74%), 5e, 5f (67%), 1, 2, 3, 5d (58%), and 4 (53%).

VII Evaluation Summary and Suggestions

A. The Outstanding points (Strengths) of the Programs Instruction

The 12 principals from small-size schools in their response to this statement provided a total of 15 qualitative statements that could be placed in one of these four categories: student, teacher, school, or community.

These principals felt that one of the major strengths of the industrial arts program was that the students were enrolled because they could make useful things and at the same time develop competencies and attitudes that they could use later in life. These students were capable of putting theory into practice which was evident by what they made. The students were readily admitted to either a vocational education program or to a technical institute because of the skill base and the attitudes they acquired in industrial arts. As a result of the instruction they received some of the students won skills competitions in the educational region in which the school was located.

The industrial arts teachers or their schools were considered by their principals to be highly skilled, professional, and dedicated to the students and the profession. These attitudes had a positive affect on the students who attended the school. The industrial arts teachers used creative instructional activities that challenged the students' activities and helped to develop the students' creative abilities.

The school presented an industrial arts program that would achieve the program objectives that were within the ability range of the students. This was accomplished with limited funding from the Ministry of Education. The school and its administration see the objective of industrial arts, in some instances, to be a feeder program for vocational education or as one of skill develop to meet the manpower needs of the local community. This violates the philosophy and the purpose of industrial arts.

It was evident from the comments of the principals from small-size schools that they collaborated with their communities and the industries of the communities who provided the school with materials, equipment, and funds to support their schools industrial arts program. This was of benefit to both the schools and the industry. This helped to school to cope with a financial shortfall and industry received a product that had a limited skill base with attitudes that were properly being formed.

B. The Weaknesses or Limitations of the Program (Instruction)

The 12 principals in responding to this statements provided 14 statements that were synthesized under these headings: Ministry of Education, schools, teacher, and percents.

The principals by the comments indicated that the industrial arts program of their schools suffered because of a lack of sufficient funding from the Ministry of Education and as a result they had to turn to the community for funds. The principals were equally as critical of the Ministry of Education for the curriculum it provided for industrial arts. To them it was too rigid, it was obsolete, and it was in need of revision. That curriculum needs to be planned so that the amount of instructional time is realistic and appropriate for the instructional activities to be taught was also mentioned by the principals. The principals felt that the current curriculum did not meet the needs of the community nor did it offer a wide variety of courses that would serve the needs of the community.

The industrial arts facilities of some schools need to be expanded if they are to meet the demands placed on them by the number of students who want to enroll. Both the facilities with attendant equipment as well as the instructional content need to be updated to a technological base if the students are to become technologically literate. The principals in planning their schedules need to allocate more time for teaching industrial arts. One of the major weaknesses of the industrial arts program was the lack of equipment and qualified teachers with the requisite competencies that are needed to use the equipment in a safe manner. Some schools lacked shop facilities, materials, furniture and equipment to present a viable industrial arts program.

Some of the teachers who are highly qualified to teach industrial arts are not student centered and do not devote enough time or effort to the students. Much of the equipment breakdown can be attributed to teacher apathy, incompetence, the inability to operate this equipment or the inability to repair it. Closely related is the fact that these teachers had either insufficient preparation or in-service training.

The attitudes of parents, academic teachers, and students toward the industrial art program is that there is no educational benefit to the student who is college bound. This attitude is particularly prevalent among parents who are part of the business community.

C. Suggestions

For this portion of the instrument participants were asked to prioritize the suggestions they would offer or propose to correct or improve the weaknesses or limitations of the industrial arts program. In order of priority the principals placed their suggestions under these headings: Ministry of Education, course, schools, teachers, and parents.

The Ministry of Education needs to provide the following to the schools if industrial arts is to provide a program that is interesting and challenging to the students and to their abilities:

1. Provide adequate funding on an "evergreen" basis to the industrial arts program so that the necessary hardware and software can be purchased to keep the program on the cutting edge.
2. Examine closely the teacher education program so that the industrial arts teachers completing the program are qualified in the competencies they are to teach. These teacher should develop the confidence to operate and demonstrate power equipment in a safe manner. All these teachers should develop the competencies to repair the equipment in their shops.
3. Provide facilities that are properly designed and in accordance with the needs and course offerings that will meet the needs of the schools.
4. Provide and organize annual in-service training for the industrial arts teachers to keep the teachers up-to-date, to allow them to renew or develop their

skill base, to be apprised of the current trends in technology as it impacts industrial arts, and to exchange ideas with their colleagues.

5. Provide supervisors who are gregarious, competent with hand tools and machine tools, friendly, receptive, understanding and do not possess a superior attitude. Former teachers who are willing to get their "hands dirty" to improve the quality of teaching of the one being supervised should be appointed to supervisory positions.
6. Provide the industrial arts teachers with a curriculum that is relevant and current in its instructional content and to provide the learning resources to support the content of the curriculum.

Although courses were considered as a separate entity they are the responsibility of curriculum designers of the Department of General Education. When a new curriculum for industrial arts is being written these personnel need to take these suggestions under consideration:

1. There needs to be a greater variety of industrial arts courses offered in small-size schools. These course should be realistic in order to meet the needs of the students.
2. There needs to be more time allocated to industrial arts if the objectives of the program and of the students are to be met.

3. The courses that are prepared should be part of a curriculum spiral so that competencies acquired in one course are built-upon in a subsequent course which might be fundamental for advanced study at a post-secondary institution.
4. These courses when designed need to contain a major part of their content from the basic technologies for their technology base.

The principals indicated by their suggestions that not only did the curriculum for industrial arts need revision but the facilities in their schools were obsolete and needed:

1. To be brought up-to-date with sufficient instructional areas that are properly and adequately equipped to accomplish the objectives of the program.
2. To be designed so that the basic technologies and related technological concepts can be taught.
3. To be organized with the proper utilities so that the individualization of instruction can become an integrated part of the instructional delivery system.

The principals had a number of suggestions that were directed at the teachers to build on the strengths or improve the weaknesses of the program.

1. The teachers need to become more involved with the process of upgrading the instructional materials they use to support instruction.

2. The teachers need to take better care of the shops and repair the equipment that has either malfunctioned or become inoperable.
3. The teachers must become more conscientious of safety and provide adequate personal safety equipment for the learner.
4. The teachers need to make a greater effort to become involved with professional in-service to increase their competencies and enhance their skill base.
5. The teachers need to remove their bias when grading a students' work.

The principals had only one suggestion for the parents which was for them to become more tolerant of the industrial arts program and the students who enroll in this program. Parents employed in service or in white collar occupations often encouraged their children to avoid taking industrial arts programs.

A. The Outstanding points (Strengths) of the Programs Instruction

Teachers = 12

The 12 industrial arts teachers from small size schools provided eight statements that could be synthesized under the headings students/school, career guidance, curriculum, and skill development.

These teachers indicated that industrial arts were beneficial to students because these courses provided them with a skill base they could use to further their education at either a vocational education school or a technical institute. The teachers also saw a strength of the industrial arts program as the ability to provide students with skills they could use in the world of work. This was accomplished in courses where students worked with hand tools, machine tools, materials and processes.

Another strength of industrial arts from the teachers' perspective was the variety of courses that schools made available to their students. This variety provided students with opportunities to select courses that were of interest to them and within their ability range.

The student in small-size schools were fortunate because the school administrator assigned industrial arts teachers to teach course that were compatible without the teachers' background and experience.

The industrial arts program served a career guidance function in the schools because it exposed students to a wide variety of tools, materials, and processes that were found in a number of occupations or in post-secondary education programs that required these skills. As a consequence of working with these tools and materials students could be influenced to enter or reject an occupation involving these skills. Thus industrial arts served a positive/negative guidance function.

Articulation of the industrial arts curriculum for lower secondary education with that of upper secondary education provided students with a foundation that could help them establish an integrated career ladder.

The learning activities of industrial arts involve the three learning domains. The heavy emphasis placed on the psychomotor domain provides students with use level of skill development and this is foundational for further skill development. In developing use level of skill students also develop skills in the cognitive and affective learning domains.

B. The Weaknesses or Limitations of the Program (Instructional)

The industrial arts teachers who taught in small-size schools listed a total of ten weaknesses of the industrial arts program. These weaknesses were placed into one of the following four categories: student/school, funding for the program, teachers and curriculum.

Some industrial arts courses had low enrolments because of teacher and parental attitudes toward this subject area. These low enrollments could be partly attributed to the fact that school administrators, when planning time tables, did not allow sufficient time for industrial arts instruction. Another weakness industrial arts programs in some small-size schools was the inappropriateness of the shops for the type of instruction that was given. It was emphatically pointed out that there was need for sufficient instructional time supported by appropriate tools and equipment to meet the needs of students.

Approximately one-third of the weakness comments indicated that the funding for industrial arts was insufficient. The lack of funding correlated with the obsolescence of equipment and the antiquated facilities. Both limit the type of instructional activities offered. There is a correlation between equipment and instruction. The budgets that school administrators allocate have not been correlated with the rate of inflation and this has been detrimental to the industrial arts program. To close this financial gap it was suggested by some participants that school administrators encourage their students to purchase their own materials for industrial arts.

The teachers held the opinion that some of their colleagues lacked the necessary competencies to plan for and to organize the process of teaching so it proceeded from the simple to the complex and from the known to the unknown. These teachers indicated that they needed to improve their approach to safety and integrate safety practices into their demonstrations to reduce the potential for accidents.

The curriculum lacks expectations that are definitive and explicit. This nebulousness impacts both teachers and students because both are unaware when curricular expectations have been achieved. The present curriculum for industrial arts is considered to be inappropriate for the maturity of the students enrolled. A number of the teachers indicated that the time allocated to the various learning activities detailed in the curriculum was much too short.

C. Suggestions for Improvement

The teachers suggestions for negating the weaknesses of the industrial arts program were more in the form of recommendations. These recommendations were placed in this order of priority: budget, facilities, staff, curriculum, time, and in-service.

The teachers recommended that the Department of General Education should provide a budget for industrial arts that was realistic and appropriate for today's market place. They suggested a need for a budget that would allow for equipment replacement, maintenance, and modification; the renovation and construction of new facilities that would provide a pleasant learning environment; and the purchase of print and non-print media to support instruction. This budget should also provide moneys for the purchase of materials.

The facilities where industrial arts was taught were considered by the teachers to be appropriate for the 1950s but not the 1990s and beyond. These facilities should be immediately brought up-to-date with recent technologies to support instruction. Facilities should provide learners with an environment that is pleasant and conducive to learning.

The industrial arts teachers involved in this investigation considered some of their colleagues to be lacking in the skills and competencies that are required to teach this subject area. These teachers also lacked the ability to organize and structure instruction using the curriculum as a guide.

It was recommended that the Department of General Education establish a long-range plan for industrial arts that moves the program from its stagnant industrial model to a more dynamic technology model. This plan should include a change in strategy for teacher education so these teachers will be competent to teach the subjects that comprise the technology model. A part of the articulated plan should be the inclusion of a mandatory program for the in-service of industrial arts teachers. The in-service program should be on a basis where teachers would have to be in-serviced at regular intervals.

A number of recommendations concentrated on the curriculum. The teachers from small-size schools recommended that the curriculum be updated and revised with greater emphasis on modern technologies. They also recommended that curriculum designers and planners, when revising the curriculum, establish general objectives that are clear, easily understood by the stakeholders and achievable by the learners.

A. The Outstanding points (Strengths) of the Programs Instruction

Students = 24

The industrial arts students who served on the Self-evaluation Committees for the 12 small-size schools made a total of 14 statements directed at the strengths of the industrial arts program. These statements could be placed in the following categories: attitudinal development, tactile experiences acquired, career guidance, and the industrial arts teacher.

The students believed that one of the strengths of the industrial arts program was that they developed attitudes such as good work habits, punctuality, a wholesome appreciation of correct safety procedures, and the ability to work individually or in small groups while they were in the program.

According to the students, the tactile experiences acquired through hands on activities in industrial arts had the potential to benefit them in there working life or at the post-secondary level of education. They also felt that the tactile experiences developed attitudes they could use in their daily lives.

B. The Weaknesses or Limitations of the Program (Instructional)

There were 17 weaknesses of the industrial arts program that participating students from small-size schools identified. These weaknesses could be categorized into the areas of facilities, time, equipment/care, marketing the program, and instructional material.

The students considered the industrial arts facilities a major weakness of the industrial arts program. They saw the facilities as antiquated, dingy and conducive to an atmosphere that was unpleasant in which to work. They felt that the facilities were totally inadequate for the type of instruction that was offered. The school shops, according to the students, were below standards because they lacked adequate instructional space. The students emphatically pointed out a concern with the lack of personal and machine safety equipment for their protection while working with the equipment.

The students considered "time" to be problematic in the industrial arts program. They felt that the time allotted to industrial arts by school administrators was insufficient and that industrial arts should be offered at a more appropriate time during the school day. The students felt that additional time was needed to develop use-level skills with the hand and machine tools they used to manipulate materials. the students also expressed a concern with teachers who, in some instances, were considered a weakness in the program. Students pointed out that some teachers lacked either the background or the experience to teach the course content.

The students indicated that the equipment was obsolete, below modern standards, and not in good operating condition.

Poor operating equipment caused the students delays in completing their work. Noxious fumes and dust particles were not properly ventilated. It was the opinion of the students that equipment related problems were the cause of low student enrolment.

The students considered the marketing of the industrial arts program to be a weak. The work they produced wasn't exposed to anyone but themselves, their classmates, and their parents. These students had pride in their work and they felt it should be exhibited to others in the school and in the community.

The students considered the type and variety of both print and non-print instructional materials available to support instruction to be a weakness. Materials were in short supply and dated.

C. Suggestions for Improvement

The suggestions made by the students to improve the weaknesses of the industrial arts program fell into the five categories of safety, facilities, curriculum/technology, budget/fund raising, and time.

The students suggested that safety devices be installed on all hazardous equipment. They also suggested that personal safety equipment be purchased and that it be mandatory for the students to wear this equipment while working in the shop. As part of the ongoing safety program, the industrial arts teacher should be responsible for continuously checking and maintaining the equipment in the shop to insure it could be safely operated.

To improve the quality of the industrial arts program the students suggested that the industrial arts facilities be renovated with the safety and health of teachers and students given top priority. These safety standards should comply with the standards established by the World Health Organization.

As the receivers of instruction, the students were knowledgeable that the curriculum for industrial arts was out-of-date and in need of revision. It was suggested that the curriculum be revised to include additional learning activities that were technology based. It was also suggested that the program be less teacher dominated and that the curriculum permit students to develop a skill base that would be foundational for an occupation.

When the curriculum is revised there should be an increase in the time allocated to industrial arts. The students wanted additional time in the curriculum so that they could develop skills that would permit them entry into the world of work. The students felt that they did not have this opportunity in the curriculum as it was presently structured. The courses that comprise the curriculum needed to be redesigned so that they better met student needs and inclinations.

The students were aware of the budget provided to industrial arts and they considered it to be insufficient. They suggested that industrial arts be provided with appropriate funding so that facilities could be modernized, equipment brought up-to-date, and industrial arts teachers in-serviced to better hone their competencies and to increase their effectiveness as teachers. Closely related to budget was the suggestion that schools become involved in fund raising as a means of increasing the amount of funds dedicated to industrial arts. The moneys raised could be used to renovate industrial arts facilities, purchase new equipment, purchase appropriate instructional material, or repair malfunctioning equipment.

Medium Size Schools

The data and analysis that follow are from medium size schools.

Table 18

Participants Ratings: Organization for Instruction

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Current rationale developed														
	P	2	20	8	80	0	0	0	0	0	0	0	0	10
	DH	2	20	5	50	2	20	1	10	0	0	0	0	10
	T	5	25	10	50	0	0	5	25	0	0	0	0	20
	S	5	25	12	60	3	15	0	0	0	0	0	0	20
2. Philosophy, goals, objectives cooperatively developed														
	P	4	40	3	30	2	20	1	10	0	0	0	0	10
	DH	1	10	1	10	6	60	2	20	0	0	0	0	10
	T	2	10	3	15	7	35	5	25	2	10	1	5	20
	S	4	20	8	40	4	20	2	10	2	10	0	0	20

3. Philosophy, goals, objectives, consistent with local, national philosophies

P	1	10	6	60	2	20	1	10	0	0	0	0	10
DH	2	20	4	40	2	20	2	20	0	0	0	0	10
T	3	15	7	35	7	35	3	15	0	0	0	0	20
S	7	35	7	35	3	15	1	5	2	10	0	0	20

4. Philosophy goals used for planning and evaluation

P	3	30	4	40	2	20	1	10	0	0	0	0	10
DH	1	10	3	30	4	40	2	20	0	0	0	0	10
T	3	15	8	40	7	35	2	10	0	0	0	0	20
S	3	15	9	45	7	35	1	5	0	0	0	0	20

5. Philosophy, goals objectives periodically reviewed, revised

P	2	20	2	20	4	40	2	20	0	0	0	0	10
DH	1	10	2	20	3	30	2	20	2	20	0	0	10
T	1	5	7	35	5	25	3	15	3	15	1	5	20
S	2	10	7	35	5	25	4	20	1	5	1	5	20

6. Courses represented four broad systems

P	1	10	4	40	3	30	1	10	1	10	0	0	10
DH	1	10	3	30	2	20	2	20	2	20	0	0	10
T	3	15	7	35	4	20	3	15	3	15	0	0	20
S	3	15	7	35	7	35	3	15	0	0	0	0	20

Table 18 (continued)

Participants Ratings: Organization for Instruction

Medium Size Schools

7. Courses planned to achieve objectives													
P	2	20	2	20	4	40	1	10	1	10	0	0	10
DH	3	30	2	20	2	20	2	20	1	10	0	0	10
T	5	25	4	20	5	25	5	25	1	10	0	0	20
S	3	15	9	45	4	20	3	15	1	10	0	0	20
8. Program serves all students													
P	3	30	3	30	3	30	1	10	0	0	0	0	10
DH	3	30	3	30	1	10	2	20	1	10	0	0	10
T	4	20	7	35	3	15	3	15	3	15	0	0	20
S	7	35	6	30	4	20	1	5	2	10	0	0	20
9. Program up-dated regularly													
P	2	20	3	30	3	30	2	20	0	0	0	0	10
DH	1	10	4	40	3	30	1	10	1	10	0	0	10
T	2	10	7	35	6	30	4	20	1	5	0	0	20
S	4	20	6	30	5	25	3	15	2	10	0	0	20
10. Sufficient funds available to achieve program's goals and needs													
P	2	20	2	20	3	30	2	20	1	10	0	0	10
DH	0	0	4	40	3	30	2	20	1	10	0	0	10
T	1	5	3	15	5	25	10	50	1	5	0	0	20
S	1	5	4	20	6	30	7	35	2	10	0	0	20

11. Adequate support services to support program														
	P	0	0	2	20	5	50	2	20	1	10	0	0	10
	DH	1	10	2	20	2	20	4	40	1	10	0	0	10
	T	2	10	3	15	6	30	7	35	2	10	0	0	20
	S	2	10	7	35	4	20	4	20	3	15	0	0	20
12. Community people used to achieve program goals														
	P	0	0	2	20	4	40	2	20	1	10	1	10	10
	DH	1	10	2	20	1	10	4	40	1	10	1	10	10
	T	1	5	3	15	3	15	8	40	3	15	2	10	20
	S	3	15	3	15	4	20	6	30	4	20	0	0	20
13. Advisory committee used to achieve program goals														
	P	0	0	1	10	3	30	4	40	2	20	0	0	10
	DH	1	10	1	10	2	20	4	40	1	10	1	10	10
	T	1	5	2	10	4	20	8	40	4	20	1	5	20
	S	3	15	7	35	6	30	2	10	2	10	0	0	20

Table 18 (continued)

Participants Ratings: Organization for Instruction

Medium Size Schools

14. Opportunity for community partners to participate in program

P	0	0	1	10	3	30	5	50	1	10	0	0	10
DH	1	10	2	20	3	30	1	10	2	20	1	10	10
T	1	5	7	35	3	15	5	25	3	15	1	5	20
S	2	10	7	35	3	15	5	25	2	10	1	5	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Organization for Instruction

Data in Table 18 presents the frequencies and percentages for each of the 14 evaluative criteria for the organization of industrial arts instruction that were rated by the four groups in medium size schools that served as self evaluation committees in these schools.

Principles = 10

There were 14 criteria in this section. The principals rated all but 5 of them as "Adequate." Criterion (1) (100%) was rated as "High" The remaining 4 criteria were rated as "Low." The "Adequate" ratings in rank order were as follows: 2 (70%), 3 (70%), 4 (70%), 8 (60%), 6 (50%), 9 (50%), 5(40%), 7 (40%) and 10 (40%).

Department Heads = 10

The department heads rated criterion 13 (20%) and criterion 2 (20%) as "Low." The remaining 12 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 1 (70%), 3 (60%), 8 (60%), 9 (50%), 7 (50%), 10 40%) 4(40%), 6(40%), 5 (30%), 11(30%), 12 (30%), and 14 (30%)

Teachers = 20

The teachers rated criterion 1 (75%) as "High". Criterion 12 (20%), 10 (20%) and 13 (15%) were ranked as "Low". The remaining 10 criteria were ranked as "Adequate".

Their rank order was as follows: 8 (55%), 4 (55%), 3 (50%), 6 (50%), 4 (45%), 7 (45%), 5 (40%), 14 (45%) and 11 (35%).

Students = 20

The students, unlike the principals, department heads and teachers, did not rank any criteria as "Low". Criterion 1 (85%) was ranked in the "High" category. They included the remaining 13 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 3 (70%), 8 (65%), 2 (65%), 4 (60%), 7(60%), 13 (50%, 6 (50%), 9 (50%), 5 (45%), 14 (45%), 11 (35%), 17)30%) and 10 (25%).

Only the Department Heads did not include at least one of the criteria in the "High" category. However, the Principals, Department Heads and Teachers did make more liberal use of the "Low" category.

Table 19

Participants Ratings: Organization for Instruction - (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Philosophy, goals and objectives implemented														
	P	1	10	2	20	6	60	1	10	0	0	0	0	10
	DH	1	10	2	20	4	40	2	20	1	10	0	0	10
	T	2	10	3	15	8	40	5	25	0	0	2	10	20
	S	2	10	10	50	7	35	0	0	0	0	1	5	20
2. Courses available to all students														
	P	2	20	2	20	2	20	3	30	1	10	0	0	10
	DH	1	10	3	30	3	30	3	30	0	0	0	0	10
	T	3	15	6	30	10	50	1	5	0	0	0	0	20
	S	7	35	4	20	4	20	5	25	0	0	0	0	20

3. Schedules, time allotments, class sizes appropriate														
	P	1	10	3	30	3	30	3	30	0	0	0	0	10
	DH	2	20	2	20	3	30	2	20	1	10	0	0	10
	T	0	0	4	20	11	55	4	20	1	5	0	0	20
	S	3	15	7	35	4	20	5	25	1	5	0	0	20
4. Financial support adequate														
	P	0	0	1	10	5	50	4	40	0	0	0	0	10
	DH	0	0	0	0	5	50	5	50	0	0	0	0	10
	T	0	0	2	10	12	60	6	30	0	0	0	0	20
	S	0	0	6	30	9	45	3	15	2	10	0	0	20
5. Adequate cooperative planning														
	P	0	0	3	30	6	60	1	10	0	0	0	0	10
	DH	0	0	2	20	6	60	2	20	0	0	0	0	10
	T	0	0	2	10	11	55	5	25	2	10	0	0	20
	S	3	15	4	20	8	40	3	15	2	10	0	0	20
6. In-school and out-of-school resources used														
	P	0	0	2	20	3	30	4	40	1	10	0	0	10
	DH	0	0	1	10	4	40	5	50	0	0	0	0	10
	T	1	5	7	35	7	35	3	15	2	10	0	0	20
	S	4	20	5	25	7	35	2	10	1	5	1	5	20

Table 19 (continued)

Participants Ratings: Organization for Instruction - (Evaluation)

Medium Size Schools

7. Program information communicated
to stakeholders

P	1	10	2	20	3	30	2	20	2	20	0	0	10
DH	1	10	2	20	3	30	3	30	1	10	0	0	10
T	2	10	5	25	7	35	6	30	0	0	0	0	20
S	2	10	7	35	6	30	3	15	2	10	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Organization for Instruction - (Evaluation)

Table 19 presents a frequency and a percentage for each of the 7 criteria directed at evaluation of organization of industrial arts instruction in the 10 medium size participating schools.

Principles = 10

There were 7 criteria in this section. The principals rated all but 2 criteria as "Adequate." Criteria 6 (20%) and 4 (10%) were rated as "Low ." The remaining 8 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 2 (40%),3 (40%),1 (30%),5 (30%) and 7 (30%).

Department Heads = 10

The department heads rated 3 criterion 5 (20%), 6 (10%) and 4 (0%) as "High." The remaining 7 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 2 (40%),3 (40%),1 (30%) and 7 (30%).

Teachers = 20

The teachers rated criteria 3 (20%), 4 (10%) and 5 (10%) as "Low." They included the remaining 4 criteria as part of the "Adequate" category. Their ratings in rank order were as follows: 2 (45%),6 (40%),7 (35%) and 1 (25%).

Students = 20

The students included all the criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 1 (60%), 2 (55%),3 (50%),6 (45%),7 (45%),5 (35%) and 4 (30%).

Only the students did not include any of their criteria in the "Low" category. The principals. department heads and teachers made far more liberal use of the "Low" category.

Comments on Organization for Instruction

Principals

- Seven principals commented that their schools were located in small towns in which there was a great demand for industrial arts programs. The majority of students who leave their schools after completing lower secondary education seek some type of employment. It was incumbent upon the schools to provide these students with sufficient skills to help them gain employment after leaving school.

- Six principals commented that since their schools did not have sufficient facilities or equipment to respond to student needs, their schools were making every attempt to obtain community partnerships to support the teaching of industrial arts.

- Four principals indicated that in order to organize an efficient industrial arts program, it was necessary for schools to be provided with sufficient supporting funds for materials and facilities.

- Three principals pointed out that the current industrial arts curriculum does not provide sufficient instructional time for students to develop a level of skill and experience necessary for them to further their education or to obtain employment.

Department Heads

- Nine department heads suggested that in order to organize an effective industrial arts program, their schools were badly in need of additional facilities, equipment and materials in order to meet student demands.

- Eight department heads commented that their schools should be equipped so that they could offer free elective industrial arts courses so students could select courses that were suitable to their future career goals.

- Six department heads indicated that the current industrial arts curriculum was out dated since it was implemented in 1978 and should be reviewed and revised.

Teachers

- There were 9 industrial arts teachers who commented that the current industrial arts curriculum did not provide sufficient instructional time for students to develop the adequate skills and experiences necessary for them to obtain either future employment or to continue their education.

- Seven teachers indicated that the majority of students in their schools did not intend to continue their education beyond the lower secondary school level. While in school these students were making every attempt to develop a level of skill and experience that would permit them to obtain some type of gainful employment.

- Five teachers indicated that since their schools were located in small towns, it was very difficult for them to locate out-of-school resources to support the teaching of industrial arts.

- Five teachers recommended that the Department of General Education should provide facilities and equipment to given schools based upon the actual needs of the school rather than upon student enrollment.

Students

- Ten students emphasized that the instructional time for industrial arts courses be increased to provide sufficient time for students to develop the skills and knowledge necessary for either further education or to obtain employment.

- Eight students pointed to the fact that their schools did not have sufficient facilities and equipment to permit them to offer a wide range of industrial arts courses that would meet individual needs and future career goals.

- Six students commented that because of a shortage of facilities and equipment, their schools were using local resources to supplement the teaching of industrial arts.

- Five students recommended that their schools make an attempt to offer courses corresponding to their community's characteristics and its local enterprises.

- Four students commented that the current industrial arts curriculum needed to be reviewed and revised to bring it up-to-date with current technological developments.

Table 20

Participants Ratings: Description of Offerings

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Based on technological concepts, processes, and systems														
	P	7	70	1	10	2	20	0	0	0	0	0	0	10
	DH	1	10	3	30	4	40	1	10	1	10	0	0	10
	T	1	5	7	35	10	50	1	5	1	5	0	0	20
	S	2	10	9	45	7	35	1	5	1	5	0	0	20
2. Knowledge technological development effect on people														
	P	6	60	2	20	1	10	0	0	1	10	0	0	10
	DH	2	20	3	30	3	30	1	10	1	10	0	0	10
	T	3	15	6	30	4	20	4	20	3	15	0	0	20
	S	4	20	7	35	7	35	2	10	0	0	0	0	20

3. Content drawn from three major areas

P	5	50	4	40	1	10	0	0	0	0	0	0	10
DH	5	50	3	30	1	10	1	10	0	0	0	0	10
T	5	25	7	35	4	20	1	5	3	15	0	0	20
S	3	15	7	35	6	30	3	15	1	5	0	0	20

4. Developing understanding, and application of technological concepts

P	4	40	3	30	2	20	1	10	0	0	0	0	10
DH	3	30	4	40	2	20	0	0	1	10	0	0	10
T	2	10	9	35	6	30	3	30	0	0	0	0	20
S	5	25	6	30	7	35	1	5	1	5	0	0	20

5. Apply tools, materials, processes, and concepts safely

P	5	50	3	30	2	20	0	0	0	0	0	0	10
DH	3	30	3	30	3	30	1	10	0	0	0	0	10
T	7	35	6	30	5	25	2	10	0	0	0	0	20
S	5	25	7	35	4	20	4	20	0	0	0	0	20

6. Develop skills, creative abilities, and technological potentials

P	5	50	3	30	2	20	0	0	0	0	0	0	10
DH	2	20	2	20	4	40	2	10	0	0	0	0	10
T	3	15	7	35	7	35	3	15	0	0	0	0	20
S	4	20	8	40	8	40	0	0	0	0	0	0	20

Table 20 (continued)

Participants Ratings: Description of Offerings

Medium Size Schools

7. Develop problem-solving, decision-making ability													
P	4	40	4	40	2	20	0	0	0	0	0	0	10
DH	1	10	4	40	3	30	2	20	0	0	0	0	10
T	3	15	7	35	7	35	3	15	0	0	0	0	20
S	4	20	7	35	5	25	2	10	2	10	0	0	20
8. Prepare for lifelong learning													
P	5	50	3	30	2	20	0	0	0	0	0	0	10
DH	1	10	6	60	3	30	0	0	0	0	0	0	10
T	2	10	10	50	5	25	3	15	0	0	0	0	20
S	5	25	7	35	5	25	1	5	1	5	1	5	20
9. Activities reinforces abstract concepts with concrete experiences													
P	5	50	5	50	0	0	0	0	0	0	0	0	10
DH	3	30	4	40	3	30	0	0	0	0	0	0	10
T	5	25	8	40	7	35	0	0	0	0	0	0	20
S	4	20	9	45	6	30	1	5	0	0	0	0	20

10. Emphasis on combination of
"know-how" and "ability to do."

P	7	58	1	8	4	33	0	0	0	0	0	0	10
DH	5	50	4	40	1	10	0	0	0	0	0	0	10
T	8	40	8	40	4	20	0	0	0	0	0	0	20
S	9	45	6	30	5	25	0	0	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding.

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Description of Offerings

Table 20 presents the frequencies and percentages that compare data for each of the 10 statements directed at the description of industrial arts offerings in the 10 medium size schools involved in this study that were collected from the four participating groups.

Principles = 10

There were 10 criteria in this section. The principals rated all but 2 of the criteria as "High." The order in which they ranked these criteria in the "High" category was as follows: 9 (100%),3 (90%),1 (80%),2 (80%),5 (80%),6 (80%),7 (80%) and 8 (80%). The remaining 2 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 4 (70%) and 10 (66%).

Department Heads = 10

The department heads rated criterion 10 (90%) and criterion 3 (80%) as "High." The remaining 8 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 4 (70%),8 (70%),9 (70%),5 (60%),2 (50%),7 (50%),1 (40%) and 6 (40%).

Teachers = 20

The teachers rated criterion 10 (80%) as "High." They included the remaining 9 criteria as part of the "Adequate" category. Their ratings in rank order were as follows: 5

(65%),9 (65%),3 (60%),8 (60%),6 (50%),7 (50%),2 (45%),4 (45%) and 1 (40%).

Students = 20

The students, similar to the teacgers and department heads ranked criteria 10 (75%) in the "High" category. They included the remaining 9 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 9 (65%),5 (60%),6 (60%),8 (60%),1 (55%),2 (55%),4 (55%),7 (55%) and 3 (50%).

All the subjects had criteria in the "High" category and no criteria in the "Low" category. However, the principals displayed a significantly stronger "High" rating with 8 of their 10 criteria in the "High" category.

Table 21

Participants Ratings: Description of Offerings (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Information and experiences related to technology														
	P	1	10	4	40	5	50	0	0	0	0	0	0	10
	DH	2	20	2	20	6	60	0	0	0	0	0	0	10
	T	3	15	8	40	7	35	2	10	0	0	0	0	20
	S	3	15	9	45	8	40	0	0	0	0	0	0	20
2. Scope and sequence related to student's development needs														
	P	2	20	5	50	3	30	0	0	0	0	0	0	10
	DH	1	10	4	40	5	50	0	0	0	0	0	0	10
	T	1	5	10	50	5	25	4	20	0	0	0	0	20
	S	3	15	9	45	8	40	0	0	0	0	0	0	20

3. Problem-solving experiences with tools, material, technological concepts													
P	3	30	5	50	2	20	0	0	0	0	0	0	10
DH	2	20	6	60	2	20	0	0	0	0	0	0	10
T	3	15	7	35	6	30	4	20	0	0	0	0	20
S	4	20	9	45	5	25	2	10	0	0	0	0	20
4. Technological development and its effect on people/environment													
P	3	30	3	30	4	40	0	0	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	1	5	6	30	8	40	4	20	1	5	0	0	20
S	2	10	7	35	8	40	3	15	0	0	0	0	20
5. Develop students' responsibility and leadership													
P	2	20	4	40	4	40	0	0	0	0	0	0	10
DH	1	10	5	50	4	40	0	0	0	0	0	0	10
T	1	5	6	30	8	40	5	25	0	0	0	0	20
S	5	25	7	35	5	25	3	15	0	0	0	0	20
6. Program flexibility to meet needs of all students													
P	1	10	5	50	4	40	0	0	0	0	0	0	10
DH	2	20	3	30	4	40	1	10	0	0	0	0	10
T	1	5	7	35	5	25	4	20	3	15	0	0	20
S	2	10	7	35	6	30	3	15	2	10	0	0	20

Table 21 (continued)

Participants Ratings: Description of Offerings (Evaluation)

Medium Size Schools

7. Students exhibit safe working habits

P	2	20	2	20	6	60	0	0	0	0	0	0	10
DH	4	40	3	30	3	30	0	0	0	0	0	0	10
T	3	15	9	45	6	30	2	10	0	0	0	0	20
S	4	20	7	35	6	30	3	15	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Description of Offerings (Evaluation)

Table 21 presents a frequency and a percentage for each of the 7 evaluation statements that were directed at an evaluation of description of industrial arts offerings in the 10 medium size participating schools.

Principles = 10

There were 7 criteria in this section. The principals rated all but one as "Adequate." Criterion 3 (80%) was rated as "High." The remaining 6 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 2 (70%),4 (60%),5 (60%),6 (60%),1 (50%) and 7 (40%)

Department Heads = 10

The department heads rated criterion 3 (80%) as "High." The remaining 6 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 7 (70%),4 (60%),5 (60%),2 (50%),6 (50%) and 1 (40%).

Teachers = 20

The teachers rated all the criteria in the "Adequate" category. Their ratings in rank order were as follows: 7 (70%),1 (55%),2 (55%),3 (50%),6 (40%),4 (35%) and 5 (35%).

Students = 20

The students, similar to the teachers, ranked all the criteria in the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 3 (65%),1 (60%),2 (60%),5 (60%),7 (55%),4 (45%) and 6 (65%).

The principals and the department heads had the same criteria 3 (80%) ranked in the "High" category. The students and the teachers had no criteria in the "High" category.

Comments on Description of Offerings

Principals

- Nine principals recommended that the Ministry of Education should equate industrial arts students who graduate from the upper level of secondary school with graduates of vocational education schools. This would allow a greater number of students access to programs in secondary schools located throughout the country.

- Eight principals commented that the majority of the students in their schools were from low income families and did not intend to further their education beyond the lower secondary level. These students needed a wider variety of industrial arts courses to suit their needs for future employment after leaving school.

- Six principals reported that the industrial arts programs offered in their schools were too rigid and not flexible enough to meet the needs of all their students.

Department Heads

- Ten of the department heads recommended that the current industrial arts courses offered in secondary schools be reviewed and revised on a regular basis to bring the course content up-to-date and to keep it current with ongoing technological developments.

- Seven department heads suggested that because of regional diversity secondary schools should be equipped to offer industrial arts courses that would meet the needs of the students and the community in their serving area rather than being equipped to offer the same uniform courses on a nationwide basis.

- Five department heads commented that the information and experiences provided to students in the current industrial arts program were not up-to-date with today's technology.

Teachers

- Eight teachers commented that their schools made every attempt to provide a program that would allow the majority of their students to make an effective transition from school to the work place. This was seen as particularly important for students who leave school after Grade 9.

- Seven teachers indicated that the industrial arts programs offered in their schools were in the processes of preparing students for lifelong learning in a technological society.

- Five teachers recommended that the instructional time of the current industrial arts program offered in secondary schools be increased to allow sufficient time for students to develop skills, knowledge, and experiences that would be congruent with student career goals.

Students

- Twelve students suggested that the industrial arts program offered in their schools should be more flexible in order to meet the needs of all students.
- Ten students made the comment that their schools should be equipped with computers to enable them to become computer literate in a society that is computer oriented.
- Four students commented that they wanted activity-oriented laboratory instruction in industrial arts to provide concrete experience that would correlate and reinforce abstract concepts.

Table 22

Participants Ratings: Components Instructional Program - Faculty

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria	Rating												
	5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Meet degree certification and competency requirements													
P	6	60	4	40	0	0	0	0	0	0	0	0	10
DH	4	40	4	40	2	20	0	0	0	0	0	0	10
T	10	50	6	30	2	10	2	10	0	0	0	0	20
S	7	35	9	45	2	10	2	10	0	0	0	0	20
2. Competent in researching, planning, directing, evaluating activities													
P	5	50	4	40	1	10	0	0	0	0	0	0	10
DH	4	40	4	40	2	20	0	0	0	0	0	0	10
T	7	35	7	35	6	30	0	0	0	0	0	0	20
S	10	50	8	40	2	10	0	0	0	0	0	0	20

3. Broad preparation and certification in four major systems														
	P	3	30	6	60	1	10	0	0	0	0	0	0	10
	DH	3	30	3	30	3	30	1	10	0	0	0	0	10
	T	3	15	3	15	3	15	4	20	4	20	3	15	20
	S	4	20	7	35	5	25	4	20	0	0	0	0	20
4. Technically competent in assigned teaching area(s)														
	P	4	40	5	50	1	10	0	0	0	0	0	0	10
	DH	4	40	4	40	2	20	0	0	0	0	0	0	10
	T	6	30	8	40	3	15	3	15	0	0	0	0	20
	S	7	35	6	30	5	25	2	10	0	0	0	0	20
5. Knowledge of legal requirements for laboratory operation														
	P	4	40	4	40	2	20	0	0	0	0	0	0	10
	DH	5	50	3	30	2	20	0	0	0	0	0	0	10
	T	5	25	9	45	4	20	2	10	0	0	0	0	20
	S	5	25	7	35	8	40	0	0	0	0	0	0	20
6. Possesses plan to develop professional, technical competencies														
	P	4	40	4	40	2	20	0	0	0	0	0	0	10
	DH	4	40	3	30	3	30	0	0	0	0	0	0	10
	T	7	35	6	30	5	25	2	10	0	0	0	0	20
	S	3	15	9	45	6	30	2	10	0	0	0	0	20

Table 22 (continued)

Participants Ratings: Components Instructional Program - Faculty

Medium Size Schools

7. Cooperation plan with supporting personnel of implementation instruction														
	P	5	50	3	30	2	20	0	0	0	0	0	0	10
	DH	4	40	2	20	3	30	1	10	0	0	0	0	10
	T	2	10	6	30	7	35	3	15	2	10	0	0	20
	S	6	30	7	35	6	30	1	5	0	0	0	0	20
8. Possession of current knowledge of industrial education														
	P	2	20	3	30	4	40	0	0	1	10	0	0	10
	DH	4	40	3	30	3	30	0	0	0	0	0	0	10
	T	5	25	8	40	3	15	4	20	0	0	0	0	20
	S	6	30	7	35	5	25	2	10	0	0	0	0	20
9. Adhere to written code of ethics														
	P	4	40	5	50	1	10	0	0	0	0	0	0	10
	DH	5	50	4	40	1	10	0	0	0	0	0	0	10
	T	7	35	8	40	5	25	0	0	0	0	0	0	20
	S	8	40	8	40	4	20	0	0	0	0	0	0	20

10. Competent written, oral language skills

P	3	30	7	70	0	0	0	0	0	0	0	0	10
DH	4	40	5	50	1	10	0	0	0	0	0	0	10
T	9	45	11	55	0	0	0	0	0	0	0	0	20
S	6	30	9	45	5	25	0	0	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Faculty

Table 22 presents the frequencies and percentages for each of the 10 descriptive criteria directed at components of the industrial arts instructional program (faculty) in the 10 medium size schools involved in this study.

Principles = 10

There were 10 criteria in this section. The principals rated the criterion 8 (50%) in the "Adequate" category. The remaining 9 criteria were rated as "High." The "High" ratings in rank order were as follows: 1 (100%),10 (100%),2 (90%),3 (90%),4 (90%),9 (90%), 5 (80%), 6 (80%) and 7 (80%)

Department Heads = 10

The department heads rated the following 6 criteria as "High:" 9 (90%),10 (90%),1 (80%),2 (80%),4 (80%) and 5 (80%). The remaining 4 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 6 (70%),8 (70%),3 (60%) and 7 (60%).

Teachers = 20

The teachers rated 10 (100%), 1 (80%) and 9 (75%) in the "High." category. The remaining 7 criteria were in the "Adequate" category. Their ratings in rank order were as follows: 2 (70%),4 (70%),5 (70%),6 (65%), 8 (65%), 7(40%) and 3 (30%).

Students = 20

The students ranked criteria 2 (90%),1 (80%),8 (80%) and 10 (75%) in the "High" category. They included the remaining 6 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 4 (65%),7 (65%),6 (65%),5 (60%),6 (60%) and 3 (55%).

All the respondents showed a prominent use of the "High" category.

Table 23

Participants Ratings: Components Instructional Program - Faculty (Evaluation)

Medium sized Schools

N = P 10
DH 10
T 20
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate preparation to teach subjects														
	P	4	40	3	30	3	30	0	0	0	0	0	0	10
	DH	3	30	5	50	2	20	0	0	0	0	0	0	10
	T	5	25	8	40	4	20	3	15	0	0	0	0	20
	S	2	10	11	55	5	25	2	10	0	0	0	0	20
2. Informed of current educational development														
	P	2	20	3	30	5	50	0	0	0	0	0	0	10
	DH	1	10	2	20	4	40	2	20	1	10	0	0	10
	T	3	15	4	20	6	30	7	35	0	0	0	0	20
	S	6	30	6	30	5	25	3	15	0	0	0	0	20

3. Commitment to professional growth														
	P	4	40	2	20	4	40	0	0	0	0	0	0	10
	DH	2	20	3	30	5	50	0	0	0	0	0	0	10
	T	3	15	7	35	8	40	2	10	0	0	0	0	20
	S	6	30	9	45	3	15	2	10	0	0	0	0	20
4. Well-defined industrial point of view toward specialization														
	P	4	40	3	30	3	30	0	0	0	0	0	0	10
	DH	1	10	5	50	4	40	0	0	0	0	0	0	10
	T	4	20	7	35	5	25	4	20	0	0	0	0	20
	S	3	15	8	40	9	45	0	0	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Faculty (Evaluation)

Table 23 presents the frequencies and percentages for each of the 4 descriptive criteria directed at components of the industrial arts instructional program (faculty evaluation) in the 10 medium size schools involved in this study.

Principles = 10

There were 4 criteria in this section. The principals rated all criteria in the "Adequate." category. The "Adequate" ratings in rank order were as follows: 1 (70%),4 (70%),3 (60%) and 2 (50%).

Department Heads = 10

The department heads rated criterion 1 (80%) as "High." The remaining 3 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 4 (60%),3 (50%) and 2 (30%).

Teachers = 20

The teachers rated all the criteria as "Adequate." Their ratings in rank order were as follows: 1 (65%), 4 (55%), 3 (50%) and 2 (35%).

Students = 20

The students had 1 criteria in the "High" category; 3 (75%). The remaining 3 criteria were part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 1 (65%),2 (60%) and 4 (55%).

Only the department heads and the students had one of there criteria in the "High" category. None of the respondents had any criteria in the "Low" category.

Comment on faculty

Principals

- Ten principals commented that their industrial arts staff were in dire need of in-service training to update them with new skills and information that correlated with current technology.

- Eight principals recommended that the Department of General Education regularly organize in-service training for industrial arts teachers in order to provide them with the new skills, knowledge, and information necessary to bring them up-to-date with current advances in technology and to increase their efficiency as teachers.

- Seven principals commented that in some areas because of a shortage of qualified industrial arts teachers, they were forced to use either technicians or skilled tradesmen with no teacher education background to teach industrial arts courses. Without an adequate teacher education background, these individuals did not have the competencies to organize or structure instructional activities efficiently.

- Nine principals commented that some industrial arts teachers in their schools were not dedicated and did not devote themselves to their teaching either in terms of time or effort.

Department Heads

- Eight department heads strongly commented that industrial arts teachers on their staff lacked the following competencies: equipment maintenance, school shop house keeping, record keeping, inventory maintenance, student achievement evaluation, and safety practices. To negate these deficiencies, these department heads recommended to the Department of General Education that in-service training be organized that would prepare these industrial arts teachers with the aforementioned competencies.

- Seven department heads commented that their staff were well-qualified in teaching different areas of industrial arts. However, the facilities and equipment that have been provided to their schools, which is uniform nationwide, did not correlate with the industrial arts teachers' education, background, or expertise.

- Seven department heads recommended that the Department of General Education organize, on a regular basis, in-service training to keep their industrial arts staff up-to-date on current technological developments as these developments impact industrial arts.

- Five department heads suggested that the school administrative committee as well as all school supporting staff, recognize the importance of the industrial arts program and provide full support to the program in terms of budget and facilities.

Teachers

- Twelve industrial arts teachers commented that they were in dire need of attending either a seminar or in-service training to improve their skills and knowledge and to increase their ability to do a better teaching job. These teachers indicated that they had become stagnate and had not attempted to improve their professional competencies since graduating from university nor had they engaged in any form of personnel development during their entire teaching career.

- Ten industrial arts teachers suggested that there should be more than one institution in the country that offered a graduate program in industrial arts teacher education. This would allow more teachers access to graduate programs.

- Seven industrial arts teachers commented that there was a need for a centrally located meeting center for industrial arts teachers where they could meet on a regular basis to exchange professional information and discuss current educational developments in areas in which they were teaching.

Students

- Fifteen students believed that their teachers were very competent in their teaching areas, but that they should devote themselves more to their students by offering assistance and guidance to students on an individual basis.

- Twelve students commented that their teachers did not recognize individual student differences because they gave the same instructional activities to all students in class.

- Seven students commented that some of their industrial arts teachers were not sufficiently prepared when giving demonstrations or lecturing. Often, they did not have equipment and/or materials ready prior to class.

Table 24

Participants Ratings: Components of the Instructional Program - Instructional Activities

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Teacher planning consistent with program goals, objectives														
	P	4	40	5	50	1	10	0	0	0	0	0	0	10
	DH	1	10	6	60	3	30	0	0	0	0	0	0	10
	T	5	25	9	45	5	25	1	5	0	0	0	0	20
	S	3	15	13	65	4	20	0	0	0	0	0	0	20
2. Lesson plans based on course of study, and student needs														
	P	1	10	7	70	2	20	0	0	0	0	0	0	10
	DH	2	20	4	40	4	40	0	0	0	0	0	0	10
	T	5	25	9	45	6	30	0	0	0	0	0	0	20
	S	3	15	10	50	7	35	0	0	0	0	0	0	20

3. Teacher develop/obtain appropriate, up-to-date instructional materials													
P	1	10	2	20	6	60	1	10	0	0	0	0	10
DH	0	0	4	40	3	30	3	30	0	0	0	0	10
T	2	10	5	25	9	45	4	20	0	0	0	0	20
S	3	15	8	40	4	20	2	10	3	15	0	0	20
4. Plan/provide for evaluation of instruction													
P	1	10	5	50	4	40	0	0	0	0	0	0	10
DH	2	20	7	70	1	10	0	0	0	0	0	0	10
T	3	15	11	55	5	25	1	5	0	0	0	0	20
S	3	15	12	60	5	25	0	0	0	0	0	0	20
5. Alternative methods used to assist students to meet course objectives													
P	2	20	4	40	4	40	0	0	0	0	0	0	10
DH	3	30	3	30	4	40	0	0	0	0	0	0	10
T	7	35	6	30	5	25	2	10	0	0	0	0	20
S	5	25	7	35	5	25	3	15	0	0	0	0	20
6. Activities develop understanding of technology													
P	1	10	5	50	3	30	1	10	0	0	0	0	10
DH	4	40	3	30	2	20	1	10	0	0	0	0	10
T	3	15	8	40	7	35	2	10	0	0	0	0	20
S	3	15	8	40	5	25	4	20	0	0	0	0	20

Table 24 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Medium Size Schools

7. Improve student ability to make career choices														
	P	1	10	6	60	3	30	0	0	0	0	0	0	10
	DH	4	40	3	30	3	30	0	0	0	0	0	0	10
	T	5	25	7	35	3	15	5	25	0	0	0	0	20
	S	4	20	9	45	3	15	4	20	0	0	0	0	20
8. Equips students with transferable skills for further preparation														
	P	4	40	2	20	4	40	0	0	0	0	0	0	10
	DH	3	30	3	30	4	40	0	0	0	0	0	0	10
	T	5	25	7	35	5	25	3	15	0	0	0	0	20
	S	3	15	9	45	6	30	2	10	0	0	0	0	20
9. Emphasis on lifelong learning in technological society														
	P	3	30	5	50	2	20	0	0	0	0	0	0	10
	DH	3	30	4	40	2	20	0	0	1	10	0	0	10
	T	9	45	2	10	6	30	3	15	0	0	0	0	20
	S	2	10	9	45	7	35	2	10	0	0	0	0	20

10. Develop skills, positive self-concepts, individual potentials in technology

P	1	10	7	70	2	20	0	0	0	0	0	0	10
DH	4	40	2	20	4	40	0	0	0	0	0	0	10
T	7	35	8	40	3	15	2	10	0	0	0	0	20
S	5	25	7	35	5	25	3	15	0	0	0	0	20

11. Application of tools, materials, machines, processes, technical concepts taught

P	3	30	4	40	3	30	0	0	0	0	0	0	10
DH	3	30	4	40	2	20	1	10	0	0	0	0	10
T	6	30	7	35	5	25	2	10	0	0	0	0	20
S	6	30	9	45	5	25	0	0	0	0	0	0	20

12. Creative, critical thinking, decision making, problem solving skills taught

P	2	20	4	40	4	40	0	0	0	0	0	0	10
DH	4	40	3	30	3	30	0	0	0	0	0	0	10
T	7	35	7	35	5	25	1	5	0	0	0	0	20
S	4	20	9	45	7	35	0	0	0	0	0	0	20

13. Teacher-centered and student-centered instructional methods used

P	4	40	2	20	4	40	0	0	0	0	0	0	10
DH	5	50	2	20	3	30	0	0	0	0	0	0	10
T	7	35	9	45	4	20	0	0	0	0	0	0	20
S	5	25	9	45	5	25	0	0	1	5	0	0	20

Table 24 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Medium Size Schools

14. Multi-disciplinary learning opportunities provided													
	P	1	10	6	60	3	30	0	0	0	0	0	0	10
	DH	3	30	3	30	4	40	0	0	0	0	0	0	10
	T	2	10	9	45	5	25	4	20	0	0	0	0	20
	S	4	20	7	35	7	35	0	0	2	10	0	0	20
15. Group and individual learning activities used														
	P	4	40	3	30	2	20	1	10	0	0	0	0	10
	DH	5	50	2	20	2	20	1	10	0	0	0	0	10
	T	7	35	5	25	5	25	3	15	0	0	0	0	20
	S	8	40	3	15	8	40	1	50	0	0	0	0	20
16. Student leadership skills developed through curricular, co-curricular activities														
	P	3	30	4	40	1	10	1	10	0	0	0	0	9
	DH	4	40	3	30	3	30	0	0	0	0	0	0	10
	T	5	25	7	35	6	30	2	10	0	0	0	0	20
	S	5	25	3	15	8	40	4	20	0	0	0	0	20

17. Community resources supplement instruction

P	0	0	1	10	5	50	3	30	1	10	0	0	10
DH	1	10	3	30	4	40	1	10	1	10	0	0	10
T	2	10	6	30	7	35	1	5	4	20	0	0	20
S	1	5	7	35	5	25	4	20	3	15	0	0	20

18. Students use in-school and out-of-school resources to fulfill assignments

P	0	0	3	30	6	60	1	10	0	0	0	0	10
DH	1	10	3	30	4	40	0	0	2	20	0	0	10
T	3	15	5	25	7	35	2	10	3	15	0	0	20
S	1	5	7	35	5	25	2	10	5	25	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Instructional Activities.

Table 24 presents the frequencies and a percentage for each of the 18 statements directed at components of the industrial arts instructional program (instructional activities) in the 10 medium size schools involved in this study.

Principles = 10

There were 18 criteria in this section. The principals rated criterion 17 (10%) as "Low." Four criteria were rated in the "High" category. The High ratings in rank order were 1 (90%), 2 (80%), 9 (80%) and 10 (80%), The remaining 13 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 7 (70%),11 (70%),15 (70%),14 (70%),16 (70%),4 (60%),5 (60%),6 (60%),7 (60%),12 (60%),13 (60%),3 (30%) and 18 (30%).

Department Heads = 10

The department heads rated criterion 4 (90%) as "High." The remaining 17 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 1 (70%),6 (70%),7 (70%),13 (70%),9 (70%),11 (70%),12 (70%),15 (70%),16 (70%),14 (60%),2 (60%),5 (60%),8 (60%), 10 (60%), 3 (40%), 17 (40%) and 18 (40%).

Teachers = 20

The teachers ranked 13 (80%) and 10 (75%) in the "High" category. The remaining 16 criteria were ranked as "Adequate". Their ratings in rank order were as follows: 1 (70%),2 (70%),4 (70%),12 (70%),5 (65%),11 (65%),7 (60%),8 (60%),15 (60%),16 (60%),6 (55%),9 (55%),14 (55%),17 (40%),18 (40%) and 3 (35%).

Students = 20

The students ranked three criteria, 1 (80%), 4 (75%) and 11 (75%) in the "High" category. They included the remaining 15 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 13 (70%),2 (65%),7 (65%),12 (65%),5 (60%),8 (60%), 10 (60%),3 (55%),6 (55%),9 (55%),14 (55%),15 (55%),16 (40%), 17 (40%) and 18 (40%).

Only the principals had one criteria in the "Low" rating. All of the subjects had criteria in the "High" rating.

Table 25

Participants Ratings: Components of the Instructional Program - Instructional Activities (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional activities effectively related to students' needs, goals														
	P	3	30	4	40	3	30	0	0	0	0	0	0	10
	DH	4	40	3	30	1	10	2	20	0	0	0	0	10
	T	5	25	7	35	6	30	2	10	0	0	0	0	20
	S	9	45	3	15	7	35	1	5	0	0	0	0	20
2. Adequate planning, preparation for instructional program														
	P	3	30	3	30	4	40	0	0	0	0	0	0	10
	DH	2	20	5	50	3	30	0	0	0	0	0	0	10
	T	3	15	9	45	3	15	5	25	0	0	0	0	20
	S	4	20	11	55	5	25	0	0	0	0	0	0	20

3. Community resources effectively incorporated into instructional program														
P	0	0	2	20	4	40	2	20	2	20	0	0	10	
DH	2	20	1	10	4	40	0	0	3	30	0	0	10	
T	0	0	5	25	7	35	3	15	5	25	0	0	20	
S	2	10	7	35	6	30	3	15	2	10	0	0	20	
4. Teachers effectively work with academic teachers														
P	2	20	4	40	3	30	1	10	0	0	0	0	10	
DH	3	30	3	30	2	20	0	0	2	10	0	0	10	
T	5	25	6	30	4	20	2	10	3	15	0	0	20	
S	3	15	8	40	8	40	0	0	1	5	0	0	20	

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components Instructional Program: Instructional Activities (Evaluation)

Table 25 presents the frequencies and a percentage for each of the 4 statements directed at components of the instructional program (instructional activities - evaluation) in the 10 medium size schools involved in this study.

Principles = 10

There were 4 criteria in this section. The principals rated one criterion 3 (20%) in the "Low" category. The remaining 3 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 1 (70%), 2 (60%) and 4 (60%).

Department Heads = 10

The department heads had all their criteria rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 1 (70%),2 (70%),4 (60%) and 3 (30%).

Teachers = 20

The teachers had all their criteria rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 1 (60%),2 (60%),4 (55%) and 3 (35%).

Students = 20

The students ranked criterion 2 (75%)in the "High" category. They included the remaining 3 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 1 (60%), 4 (55%) and 3 (45%).

Only the principals had one criteria in the "Low" rating. However, the students did have one criteria in the "High" category.

Comments on Instructional Activities

Principals

- Ten principals commented that their schools tried to incorporated community resources into the instructional program for industrial arts by using local resource people and facilities available in the community.
- Eight principals reported that their schools made an effort to offer instructional activities in areas required by the local labor market so students might be able to earn some money while attending school.
- Five principals commented that their schools had received excellent cooperation and support from the communities in their service areas in terms of providing resource persons, equipment, and other resources that were available.

- Three principals reported that their schools were attempting to offer industrial arts instructional activities that were suitable to the communities in their service areas so that their students might be able to apply what they learned in school in their daily lives.

Department Heads

- Eight department heads commented that their schools were only able to organize very limited instructional activities for some industrial arts areas because of insufficient facilities, equipment and well-qualified personnel.

- Seven department heads commented that their schools made use of community partnerships by having their students train at vocational centers or private enterprises in nearby communities.

- Five department heads reported that their schools organized industrial arts instructional activities that permitted students to earn some money to supplement the income of their parents while these students were attending school.

Teachers

- Ten teachers commented that their schools offered very limited instructional activities as a result of insufficient facilities and equipment.

- Seven teachers commented that their schools had a very good relationship with the communities in their service areas. As a result, available community resources, in terms of facilities, equipment and people, were often used to supplement the instructional activities in the industrial arts program.

- Seven teachers recommended that the Department of General Education provide their schools with sufficient and up to date industrial arts facilities, equipment, technical textbooks and supporting teaching aids that would enable their schools to offer effective and motivational instructional activities.

Students

- Ten students reported that their class sizes for industrial arts were too large. As a result, students had to wait for an inordinate amount of time before they had the opportunity to use tools and equipment. At times this caused the students great difficulty in trying to finish their projects.

- Seven students commented that their school shops had facilities and equipment that were not suitable for offering effective instructional activities for industrial arts. Therefore, these students felt that it was necessary to replace this out dated equipment with newer equipment that reflected current technology.

- Seven students commented that their teachers tended to make use of teacher-centered instructional methods solely and avoided using student-centered methods for the presentation of industrial arts content.

Table 26

Participants Ratings: Components of the Instructional Program - Material and Media

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Wide range reading materials available														
	P	0	0	3	30	5	50	2	20	0	0	0	0	10
	DH	0	0	2	20	4	40	3	30	1	10	0	0	10
	T	0	0	2	10	5	25	7	35	6	30	0	0	20
	S	0	0	5	25	9	45	4	20	2	10	0	0	20
2. Material provided for different student's ability levels														
	P	2	20	2	20	4	40	2	20	0	0	0	0	10
	DH	1	10	3	30	3	30	3	30	0	0	0	0	10
	T	0	0	3	15	4	20	10	50	3	15	0	0	20
	S	0	0	7	35	6	30	7	35	0	0	0	0	20

3. Variety of instructional equipment available and used

P	1	10	3	30	3	30	3	30	0	0	0	0	10
DH	0	0	4	40	3	30	3	30	0	0	0	0	10
T	0	0	3	15	9	45	6	30	2	10	0	0	20
S	2	10	4	20	11	55	3	15	0	0	0	0	20

4. Resource units, study guides, support materials used

P	0	0	3	30	4	40	3	30	0	0	0	0	10
DH	0	0	2	20	5	50	2	20	1	10	0	0	10
T	0	0	3	15	4	20	7	35	6	30	0	0	20
S	1	5	5	25	6	30	5	25	3	15	0	0	20

5. Adequate instructional materials to meet program goals

P	0	0	3	30	3	30	2	20	2	20	0	0	10
DH	0	0	1	10	4	40	2	20	3	30	0	0	10
T	0	0	4	20	3	15	10	50	3	15	0	0	20
S	0	0	5	25	9	45	6	30	0	0	0	0	20

6. Instructional materials provided for occupational experiences stimulation

P	0	0	6	60	4	40	0	0	0	0	0	0	10
DH	2	20	4	40	3	30	1	10	0	0	0	0	10
T	2	10	8	40	7	35	3	15	0	0	0	0	20
S	7	35	5	25	5	25	3	15	0	0	0	0	20

Table 26 (continued)

Participants Ratings: Components of the Instructional Program - Material and Media

Medium Size Schools

7. Copyright law observed in reproducing and using copyrighted materials													
P	2	20	3	30	3	30	0	0	0	0	2	20	10
DH	1	10	5	50	1	10	0	0	0	0	3	30	10
T	2	10	6	30	7	35	3	15	0	0	2	10	20
S	6	30	9	45	4	20	0	0	0	0	1	5	20
8. Guidelines established for selecting instructional materials													
P	0	0	2	20	3	30	3	30	2	20	0	0	10
DH	0	0	4	40	3	30	1	10	2	20	0	0	10
T	1	5	6	30	3	15	6	30	4	20	0	0	20
S	4	20	5	25	7	35	0	0	4	20	0	0	20
9. Faculty participate in selecting new instructional materials													
P	0	0	2	20	3	30	2	20	3	30	0	0	10
DH	1	10	3	30	2	20	3	30	1	10	0	0	10
T	3	15	5	25	7	35	3	15	2	10	0	0	20
S	1	5	10	50	8	40	1	5	0	0	0	0	20

10. Media faculty members participate in selecting new materials													
P	1	10	5	50	2	20	2	20	0	0	0	0	10
DH	2	20	4	40	3	30	0	0	1	10	0	0	10
T	1	5	5	25	7	35	5	25	2	10	0	0	20
S	2	10	5	25	8	40	3	15	2	10	0	0	20
11. Current professional publications accessible to teachers %													
P	1	10	3	30	3	30	1	10	2	20	0	0	10
DH	1	10	2	20	3	30	3	30	1	10	0	0	10
T	3	15	3	15	5	25	7	35	2	10	0	0	20
S	1	5	7	35	3	15	6	30	3	15	0	0	20
12. Audio-visual materials readily available for teacher use													
P	2	20	4	40	4	40	0	0	0	0	0	0	10
DH	1	10	2	20	3	30	2	20	2	20	0	0	10
T	4	20	5	25	5	25	3	15	3	15	0	0	20
S	3	15	10	50	5	25	0	0	2	10	0	0	20
13. Teachers and students use a variety instructional materials													
P	3	30	4	40	3	30	0	0	0	0	0	0	10
DH	2	20	4	40	2	20	2	20	0	0	0	0	10
T	2	10	5	25	7	35	4	20	2	10	0	0	20
S	3	15	10	50	7	35	0	0	0	0	0	0	20

Table 26 (continued)

Participants Ratings: Components of the Instructional Program - Material and Media

Medium Size Schools

14. Career exploration and development materials available														
	P	2	20	3	30	4	40	1	10	0	0	0	0	10
	DH	2	20	2	20	3	30	2	20	1	10	0	0	10
	T	0	0	6	30	4	20	6	30	4	20	0	0	20
	S	0	0	9	45	8	40	3	15	0	0	0	0	20
15. Suitable methods used for materials ordering, keeping inventory, material/media														
	P	1	10	5	50	4	40	0	0	0	0	0	0	10
	DH	2	20	4	40	4	40	0	0	0	0	0	0	10
	T	3	15	5	25	8	40	3	15	1	5	0	0	20
	S	1	5	11	55	3	15	5	25	0	0	0	0	20
16. Annual budget available for consumable supplies/resource materials														
	P	1	10	2	20	4	40	1	10	2	20	0	0	10
	DH	2	20	2	20	4	40	2	20	0	0	0	0	10
	T	2	10	5	25	6	30	6	30	1	5	0	0	20
	S	1	5	6	30	7	35	4	20	2	10	0	0	20

17. Adequate storage provision for materials and media	P	3	30	3	30	2	20	0	0	2	20	0	0	10
	DH	1	10	3	30	4	40	1	10	1	10	0	0	10
	T	2	10	3	15	5	25	5	25	3	15	2	10	20
	S	5	25	4	20	8	40	1	5	2	10	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Material and Media

The ratings given to the materials and media that were used to support the instructional activities for industrial arts in the 10 medium size schools involved in this study are found in Table 26 in the form of frequencies and percentages.

Principles = 10

There were 17 criteria in this section. The principals rated all but 2 criteria as "Adequate." Criteria 8 (20%) and 89 (20%) were rated as "Low." The remaining 15 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 13 (70%),17 (60%),6 (60%),10 (60%),12 (60%),15 (60%),7 (50%),14 (50%),2 (40%),3 (40%),11 (40%),1 (30%),4 (30%), 5 (30%) and 16 (30%).

Department Heads = 10

The department heads rated 3 criteria as "Low." The "Low" ratings in rank order were 1 (20%), 4 (20%) and 5 (10%). The remaining 14 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 6 (60%),7 (60%),10 (60%),13 (60%),15 (60%),2 (40%),3 (40%),8 (40%),9 (40%),14 (40%),16 (40%),17 (40%),11 (30%) and 12 (30%).

Teachers = 20

The teachers rated 5 criteria as "Low." The criteria in rank order were 5 (20%),2 (15%),3 (15%),4 (15%) and 1 (10%). They included the remaining 12 criteria as part of the "Adequate" category. Their ratings in rank order were as follows: 6 (50%),12 (45%),7 (40%),9 (40%),15 (40%),8 (35%),13 (35%),16 (35%),10 (30%),11 (30%),14 (30%) and 17 (25%).

Students = 20

The students ranked only criterion 7 (75%) in the "High" category. They included the remaining 16 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 12 (65%),13 (65%),6 (60%),15 (60%),9 (55%),8 (45%),14 (45%),17 (45%),11 (40%),2 (35%),10 (35%),16 (35%),3 (30%), 4 (30%), 1 (25%) and 5 (25%).

The principals, department heads and teachers showed a liberal use of the "Low" category. However, the students made no use of the "Low" category, but did indicate one criteria in the "High" category.

Table 27

Participants Ratings: Components of the Instructional Program - Materials and Media (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Evaluative Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate scope of instructional materials and media														
	P	1	10	4	40	3	30	0	0	2	20	0	0	10
	DH	1	10	3	30	4	40	0	0	2	20	0	0	10
	T	0	0	2	10	7	35	8	40	3	15	0	0	20
	S	0	0	5	25	11	55	3	15	1	5	0	0	20
2. Adequate quality of instructional materials and media														
	P	2	20	2	20	3	30	1	10	2	20	0	0	10
	DH	1	10	3	30	3	30	0	0	3	30	0	0	10
	T	1	5	3	15	9	45	5	25	2	10	0	0	20
	S	1	5	7	35	6	30	4	20	2	10	0	0	20

3. Adequate quantity of instructional materials and media													
	P	3	30	1	10	3	30	3	30	0	0	0	0	10
	DH	1	10	2	20	4	40	1	10	2	20	0	0	10
	T	0	0	3	15	7	35	8	40	2	10	0	0	20
	S	1	5	4	20	7	35	5	25	3	15	0	0	20
4. Instructional materials accessible to students, teachers													
	P	3	30	3	30	2	20	2	20	0	0	0	0	10
	DH	2	20	3	30	4	40	1	10	0	0	0	0	10
	T	2	10	4	20	7	35	6	30	1	5	0	0	20
	S	1	5	8	40	5	25	3	15	3	15	0	0	20
5. Instructional materials well-organized, maintained													
	P	0	0	3	30	5	50	2	20	0	0	0	0	10
	DH	1	10	3	30	4	40	2	20	0	0	0	0	10
	T	2	10	7	35	9	45	2	10	0	0	0	0	20
	S	0	0	9	45	8	40	3	15	0	0	0	0	20
6. Instructional materials used by faculty and students													
	P	2	20	6	60	2	20	0	0	0	0	0	0	10
	DH	3	30	4	40	3	30	0	0	0	0	0	0	10
	T	6	30	7	35	5	25	2	10	0	0	0	0	20
	S	5	25	11	55	4	20	0	0	0	0	0	0	20

Table 27 (continued)

Participants Ratings: Components of the Instructional Program - Materials and Media (Evaluation)

Medium Size Schools

7. Provision for storage of instructional materials														
	P	2	20	2	20	3	30	2	20	1	10	0	0	10
	DH	1	10	3	30	4	40	0	0	2	20	0	0	10
	T	1	5	3	15	4	20	7	35	5	25	0	0	20
	S	2	10	4	20	8	40	5	25	1	5	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Materials and Media (Evaluation)

Data in Table 27 presents the frequencies and the percentages for each of the 7 evaluation statements directed at materials and media components as they apply to the industrial arts instructional program in the 10 medium size schools involved in this study.

Principles = 10

There were 7 criteria in this section. The principals rated all but one criteria in the "Adequate category." Criterion 6 (80%) was rated as "High." The remaining 6 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 4 (60%),1 (50%),2 (40%),3 (40%),7 (40%) and 5 (30%).

Department Heads = 10

The department heads rated all criteria in the "Adequate." category. The criteria included in the "Adequate" rating were as follows: 6 (70%),4 (50%),1 (40%),2 (40%),5 (40%),7 (40%) and 3 (30%).

Teachers = 20

The teachers rated 4 criteria as "Low." The criteria were 2 (20%), 7 (20%), 3 (15%) and 1 (10%). They included the remaining 3 criteria as part of the "Adequate" category.

Their ratings in rank order were as follows: 6 (65%),5 (45%) and 4 (30%).

Students = 20

The students ranked criterion 6 (80%) in the "High" category. They included the remaining 6 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 4 (45%),5 (45%), 2 (40%), 7 (30%), 1 (25%) and 3 (25%).

Only the teachers placed a majority of their statements in the "Low" category. However, the principals and the students did place one statement respectively in the "High" category.

Comment on Materials and Media

Principals

- Eight principals indicated that industrial arts shops in their school were equipped with inferior quality equipment and facilities that did not meet acceptable standards.

- Six principals commented that their school shops were equipped with instructional materials and media that was inadequate in both quality and in quantity.

- Five principals pointed out that instructional materials and media found in their school shops were unsatisfactorily organized and maintained by the industrial arts teachers.

- According to the comments of four principals there was inadequate storage space in their school shops.

- Three principals commented that some of the instructional materials in their schools had not been fully utilized by either the industrial arts teachers or the students.

Department Heads

- Eight department heads commented that their school shops were equipped with an inadequate scope of instructional materials and media to serve the needs of all students who wished to take industrial arts courses.

- Seven department heads reported that instructional materials in their school shops were not satisfactorily organized and maintained by the industrial arts teachers.

- Five department heads commented that in their school shops there was inadequate storage provision for materials and media.

Teachers

- Seven teachers commented that the quantity of industrial arts instructional materials and media available in their school shops was inadequate because of large class sizes.

- Six of the teachers commented that their schools were in need of maintenance personnel to help them maintain both equipment and facilities.

- Three teachers indicated that the scope of instructional materials and media for their school shops was inadequate to support instruction.

Students

- Ten students commented that instructional materials and media in their school shops were not easily accessible to them after class hours.

- Seven students pointed out that their school shops had inadequate storage areas for instructional materials.

- Five students stated that lockers where industrial arts students could keep materials and their personal belongings should be provided.

- Four students indicated that their school shops should be equipped with an adequate quantity of instructional materials and media to help reduce class sizes. This would allow other students easier access to equipment.

Table 28

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Student assessment as an integral part of instruction														
	P	6	60	3	30	1	10	0	0	0	0	0	0	10
	DH	4	40	5	50	1	10	0	0	0	0	0	0	10
	T	6	30	9	45	5	25	0	0	0	0	0	0	20
	S	5	25	11	55	4	20	0	0	0	0	0	0	20
2. Student assessment provided for individual differences														
	P	4	40	5	50	0	0	1	10	0	0	0	0	10
	DH	2	20	4	40	3	30	1	10	0	0	0	0	10
	T	3	15	8	40	5	25	2	10	2	10	0	0	20
	S	2	10	9	45	5	25	3	15	1	5	0	0	20

3. Results of students assessment reported
to students, teachers, parents

P	3	30	3	30	2	20	2	20	0	0	0	0	10
DH	2	20	4	40	3	30	1	10	0	0	0	0	10
T	3	15	9	45	5	25	3	15	0	0	0	0	20
S	7	35	5	25	4	20	3	15	1	5	0	0	20

4. Student assessment results used for:

a. diagnosing students' learning styles,
knowledge/skills levels

P	4	40	3	30	3	30	0	0	0	0	0	0	10
DH	2	20	3	30	4	40	1	10	0	0	0	0	10
T	6	30	5	25	4	20	2	10	3	15	0	0	20
S	2	10	8	40	9	45	0	0	1	5	0	0	20

b. determining students' achievement levels

P	3	30	4	40	3	30	0	0	0	0	0	0	10
DH	2	20	5	50	3	30	0	0	0	0	0	0	10
T	4	20	10	50	3	15	3	15	0	0	0	0	20
S	5	25	8	40	5	25	2	10	0	0	0	0	20

c. assessing students' strengths and weaknesses

P	1	10	5	50	4	40	0	0	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	4	20	9	45	6	30	1	5	0	0	0	0	20
S	5	25	7	35	3	15	3	15	2	10	0	0	20

Table 28 (continued)

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Medium Size Schools

d. determining students' abilities in problem solving													
P	3	30	1	10	4	40	2	20	0	0	0	0	10
DH	1	10	3	30	5	50	1	10	0	0	0	0	10
T	4	20	9	45	5	25	2	10	0	0	0	0	20
S	0	0	10	50	5	25	3	15	2	10	0	0	20
e. counseling students													
P	2	20	3	30	5	50	0	0	0	0	0	0	10
DH	3	30	5	50	1	10	1	10	0	0	0	0	10
T	5	25	7	35	7	35	1	10	0	0	0	0	20
S	0	0	12	60	5	25	3	15	0	0	0	0	20
5. Continuous program evaluation used to determine program goals													
P	3	30	4	40	1	10	2	20	0	0	0	0	10
DH	4	40	2	20	4	40	0	0	0	0	0	0	10
T	5	25	8	40	7	35	0	0	0	0	0	0	20
S	1	5	10	50	7	35	2	10	0	0	0	0	20

6. Variety of measurement formats used to meet students' characteristics, courses objectives

P	1	10	5	50	3	30	0	0	1	10	0	0	10
DH	3	30	3	30	4	40	0	0	0	0	0	0	10
T	8	40	0	0	9	45	3	15	0	0	0	0	20
S	0	0	11	55	5	25	3	15	1	5	0	0	20

7. Program outcomes and student performance measured on appropriate data

P	2	20	4	40	3	30	0	0	1	10	0	0	10
DH	2	20	3	30	5	50	0	0	0	0	0	0	10
T	3	15	7	35	7	35	1	5	2	10	0	0	20
S	5	25	7	35	5	25	2	10	1	5	0	0	20

8. Program evaluation results used to determine teacher, program effectiveness

P	4	40	2	20	3	30	1	10	0	0	0	0	10
DH	2	20	4	40	3	30	1	10	0	0	0	0	10
T	3	15	5	25	5	25	4	20	3	15	0	0	20
S	2	10	8	40	3	15	5	25	2	10	0	0	20

Table 28 (continued)

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Medium Size Schools

9. Program evaluation results used for making program changes

P	2	20	4	40	3	30	1	10	0	0	0	0	10
DH	4	40	2	20	3	30	0	0	1	10	0	0	10
T	2	10	4	20	7	35	5	25	2	10	0	0	20
S	0	0	11	55	5	25	4	20	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program - Student Assessment and Program Evaluation

Table 28 presents frequencies and percentages for each of the 13 criteria that were used by the Self Evaluation Committee to rate the components of the industrial arts instructional program (student assessment and program evaluation) in the 10 medium size schools involved in this study.

Principles = 10

There were 13 criteria in this section. The principals rated two criteria 1 (90%) and 2 (90%) as "High." The remaining 11 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 4a (70%),4b (70%),5 (70%),3 (60%),4c (60%),6 (60%),7 (60%),8 (60%),9 (60%),4e (50%) and 4d (40%).

Department Heads = 10

The department heads rated criteria 1 (90%) and 4e (80%) as "High." The remaining 11 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 2 (60%),3 (60%),4C (60%),5 (60%),6 (60%),8 (60%),9 (60%),4a (50%),4b (50%),7 (50%) and 4d (40%).

Teachers = 20

The teachers rated criterion 1 (75%) as "High." They included the remaining 12 criteria as part of the "Adequate" category. Their ratings in rank order were as follows: 4b

(70%),4c (65%),4d (65%),5 (65%),3 (60%),4e (60%),2 (55%),4 (55%),7 (50%),6 (40%),8 (40%) and 9 (30%).

Students = 20

The students ranked criterion 1 (80%) in the "High" category. They included the remaining 12 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 4b (65%),3 (60%),4c (60%),4e (60%),7 (60%),9 (55%),2 (55%),5 (55%),6 (55%),4a (50%),4d (50%) and 8 (50%).

All of the respondents had at least one criteria in the "High" category. All the respondents indicated that criteria number 1 was highly rated.

Comments on Student Assessment and Program Evaluation

Principals

- Six principals commented that their schools were in dire need of evaluative criteria for industrial arts teachers to use as a guide to develop procedures to evaluate student achievement in industrial arts courses.

- Five principals commented that the main purpose of the industrial arts programs offered in their schools was for students to apply what they learned to their daily lives and not to prepare them for the future employment. The principals made this comment because their schools did not have adequate facilities for career training. Student assessment of industrial arts instructional activities in these schools was carried out to determine if students had achieved objectives of the courses.

- Four principals suggested that industrial arts teachers when evaluating student achievement should place more emphasis on attitudes towards the subjects, skills, safety practices, and processes used in making the projects rather than solely on the finished projects.

- Three principals commented that student assessment for the industrial arts program in their schools did not adequately provide for individual student differences.

Department Heads

- Eight department heads commented that their staff of industrial arts teachers did not fully use the evaluation results of student achievement to improve their instructional activities.

- There were six department heads who commented that the student assessment processes used by the industrial arts teachers in their school programs did not adequately provide for individual student differences.

- Four department heads indicated that their industrial arts staff lacked the competencies and techniques to evaluate student achievement in industrial arts. These teachers tended to place more emphasis on the theoretical aspects of industrial arts through pencil and paper tests rather than on the practical aspects of the subject.

Teachers

- Eight industrial arts teachers commented that the evaluation of student achievement should place more emphasis on skills and experiences acquired rather than on the final products produced.

- Six teachers commented that their school administrators placed more value on material products produced by students rather than on the educational growth of students in terms of attitudes, skills, knowledge, and experiences acquired.

- Four teachers commented that in evaluating student performance more emphasis should be placed on student attitudes toward the subject. This can be determined from student house keeping habits and safety practices in the shop.

Students

- Nine students indicated that the instructional time for industrial arts courses was inadequate if they were to acquire prerequisite skills and the experiences necessary for successful transition from school to the workplace.

- Six students were emphatic in their comments that the evaluation of industrial arts was too subjective and that some teachers were biased in the marking of student projects.

- Five students commented that the student assessment process in their schools made no provision for individual student differences.

- Four industrial arts students recommended that in the student assessment process more emphasis should be placed on how well students can apply what they learn in school to a real life situation.

Table 29

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria	Rating												
	5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional areas close to related instructional areas													
P	2	20	4	40	3	30	1	10	0	0	0	0	10
DH	3	30	3	30	2	20	2	20	0	0	0	0	10
T	8	40	8	40	2	10	2	10	0	0	0	0	20
S	6	30	4	20	8	40	2	10	0	0	0	0	20
2. Appropriate spaces provision for variety instructional activities													
P	0	0	2	20	3	30	5	50	0	0	0	0	10
DH	1	10	3	30	1	10	5	50	0	0	0	0	10
T	2	10	5	25	10	50	3	15	0	0	0	0	20
S	0	0	6	30	9	45	3	15	2	10	0	0	20

3. Laboratory floor meets acceptable standards for instructional activities												
P	2	20	4	40	2	20	2	20	0	0	0	0	10
DH	1	10	5	50	3	30	1	10	0	0	0	0	10
T	4	20	8	40	8	40	0	0	0	0	0	0	20
S	0	0	10	50	5	25	5	25	0	0	0	0	20
4. Adequate lavatory facilities for both sexes provided in close proximity												
P	1	10	2	20	5	50	2	20	0	0	0	0	10
DH	0	0	2	20	3	30	2	20	3	30	0	0	10
T	0	0	4	20	5	25	5	25	6	30	0	0	20
S	1	5	6	30	4	20	6	30	3	15	0	0	20
5. Adequate office space for each teacher												
P	1	10	2	20	5	50	3	30	0	0	0	0	11
DH	1	10	2	20	4	40	3	30	0	0	0	0	10
T	3	15	5	25	10	50	2	20	0	0	0	0	20
S	2	10	9	45	9	45	0	0	0	0	0	0	20
6. Adequate demonstration and discussion area provided												
P	0	0	0	0	5	50	4	40	1	10	0	0	10
DH	0	0	2	20	3	30	3	30	2	20	0	0	10
T	0	0	5	25	6	30	7	35	2	10	0	0	20
S	2	10	8	40	8	40	2	10	0	0	0	0	20

Table 29 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Medium Size Schools

7. Ceiling height appropriate for activities being conducted													
P	1	10	6	60	2	20	1	10	0	0	0	0	10
DH	2	20	2	20	5	50	1	10	0	0	0	0	10
T	5	25	10	50	4	20	1	5	0	0	0	0	20
S	4	20	11	55	5	25	0	0	0	0	0	0	20
8. Instructional areas have provision for adequate heat, light, ventilation, acoustics control													
P	0	0	3	30	4	40	3	30	0	0	0	0	10
DH	1	10	2	20	3	30	3	20	1	10	0	0	10
T	0	0	7	35	6	30	4	20	3	15	0	0	20
S	0	0	2	10	7	35	7	35	4	20	0	0	20
9. Proper exhaust equipment provided													
P	0	0	0	0	1	10	3	30	5	50	1	10	10
DH	0	0	0	0	2	20	2	20	4	40	2	20	10
T	0	0	3	15	0	0	4	20	9	45	4	20	20
S	0	0	0	0	2	10	5	25	10	50	3	15	20

10. Appropriate utilities provided
in instructional areas

P	0	0	0	0	4	40	4	40	2	20	0	0	10
DH	0	0	0	0	3	30	5	50	2	20	0	0	10
T	2	10	2	10	3	15	7	35	6	30	0	0	20
S	1	5	0	0	5	25	10	50	4	20	0	0	20

11. The instructional areas meet all
safety regulations

P	0	0	2	20	3	30	4	40	1	10	0	0	10
DH	2	20	1	10	3	30	3	30	1	10	0	0	10
T	1	5	4	20	5	25	6	30	4	20	0	0	20
S	2	10	0	0	8	40	5	25	5	25	0	0	20

12 Safety barriers, zones, and aisles
are properly marked

P	0	0	0	0	3	30	5	50	2	20	0	0	10
DH	1	10	1	10	2	20	4	40	2	20	0	0	10
T	0	0	4	20	5	25	5	25	6	30	0	0	20
S	0	0	3	15	5	25	2	10	8	40	2	10	20

13. Instructional area floors kept free of
waste materials, grease, obstructions

P	0	0	3	30	5	50	2	20	0	0	0	0	10
DH	2	20	4	40	2	20	2	20	0	0	0	0	10
T	3	15	8	40	6	30	3	15	0	0	0	0	20
S	2	10	4	20	10	50	4	20	0	0	0	0	20

Table 29 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Medium Size Schools

14. Non-skid surface floors on machine-operated work areas													
P	0	0	1	10	5	50	4	40	0	0	0	0	10
DH	0	0	2	20	3	30	3	50	2	10	0	0	10
T	0	0	5	25	5	25	7	35	3	15	0	0	20
S	1	5	3	15	10	50	3	15	3	15	0	0	20
15. Emergency disconnect switch for equipment easily accessible													
P	0	0	1	10	5	50	1	10	3	30	0	0	10
DH	1	10	1	10	3	30	3	30	2	20	0	0	10
T	0	0	5	25	3	15	5	25	4	20	3	15	20
S	2	10	4	20	5	25	3	15	2	10	4	20	20
16. Fire extinguishers of correct class provided in appropriate locations													
P	0	0	1	10	4	40	3	30	2	20	0	0	10
DH	2	20	0	0	2	20	4	40	2	20	0	0	10
T	1	5	3	15	3	15	7	35	6	30	0	0	20
S	3	15	8	40	3	15	4	20	2	10	0	0	20

17. A first-aid kit, related emergency supplies provided according to regulations

P	0	0	0	0	5	50	3	30	2	20	0	0	10
DH	0	0	2	20	4	40	3	30	1	10	0	0	10
T	0	0	3	15	3	15	7	35	7	35	0	0	20
S	0	0	2	10	4	20	8	40	6	30	0	0	20

18. Color-coding schemes for safety purposes used throughout the laboratory

P	0	0	2	20	0	0	4	40	4	40	0	0	10
DH	0	0	1	10	3	30	2	20	3	30	1	10	10
T	0	0	2	10	7	35	4	20	4	20	3	15	20
S	1	5	5	25	4	20	5	25	3	15	2	10	20

19. Lockable master switch boxes located in each laboratory

P	1	10	4	40	3	30	2	20	0	0	0	0	10
DH	4	40	3	30	2	20	0	0	1	10	0	0	10
T	6	30	7	35	4	20	2	10	1	10	0	0	20
S	0	0	8	40	5	25	4	20	3	15	0	0	20

20. Adequate, safe, secure storage for supplies, equipment provided

P	0	0	3	30	2	20	4	40	1	10	0	0	10
DH	0	0	1	10	3	30	4	40	2	20	0	0	10
T	1	5	3	14	5	23	5	23	7	33	0	0	21
S	1	5	6	30	7	35	4	20	2	10	0	0	20

Table 29 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Medium Size Schools

21. Adequate storage for individual and group projects

P	0	0	1	10	2	20	5	50	2	20	0	0	10
DH	0	0	0	0	3	30	3	30	3	30	1	10	10
T	0	0	2	10	4	20	6	30	7	35	1	5	20
S	0	0	3	15	6	30	7	35	2	10	2	20	20

22. Sufficient size display cases, properly located provision

P	0	0	0	0	2	20	4	40	4	40	0	0	10
DH	0	0	0	0	4	40	3	30	3	30	0	0	10
T	0	0	0	0	2	10	8	40	8	40	2	10	20
S	0	0	2	10	5	25	7	35	4	20	2	10	20

23. Appropriate storage lockers are provided for students

P	0	0	0	0	2	20	2	20	6	60	0	0	10
DH	2	20	0	0	1	10	4	40	3	30	0	0	10
T	0	0	0	0	2	10	6	30	10	50	2	10	20
S	0	0	0	0	3	15	4	20	12	60	1	5	20

24. Radioactive, flammable, corrosive materials are safely stored

P	0	0	0	0	2	20	5	50	3	30	0	0	10
DH	0	0	0	0	2	20	4	40	3	30	1	10	10
T	0	0	2	10	5	25	5	25	6	30	2	10	20
S	0	0	3	15	3	15	8	40	6	30	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program - Facilities and Equipment (Facilities)

Table 29 presents the frequencies and a percentage for each of the 24 statements directed at facilities and equipment (facilities) of the industrial arts programs in the 10 medium size schools.

Principles = 10

There were 24 criteria in this section. The principals rated 9 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 7 (70%),1 (60%),3 (60%),19 (50%),4 (30%),5 (30%),8 (30%),20 (30%) and 13 (30%). The remaining 15 criteria were rated as "Low." The "Low" ratings in rank order were as follows: 2 (20%),11 (20%),18 (20%),14 (10%),15 (10%),16 (10%),21 (10%),22 (0%),23 (0%),17 (0%),24 (0%),6 (0%),9 (0%),10 (0%) and 12 (0%).

Department Heads = 10

The department heads rated 9 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 19 (70%),1 (60%),3 (60%),13 (60%),2 (40%),7 (40%),5 (30%),8 (30%) and 11 (30%). The remaining 15 criteria were rated as "Low." The criteria included in the "Low" rating were as follows: 4 (20%), 6 (20%),12 (20%),14 (20%),15 (20%),16 (20%),17 (20%), 18 (20%),20 (10%),22 (0%),23 (0%),24 (0%),9 (0%), 10 (0%) and 21 (0%).

Teachers = 20

Two criteria 1 (80%) and 7 (75%) were rated as "High" by the teachers. The teachers rated 10 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 19 (65%),3 (60%),13 (55%),5 (40%),2 (35%),8 (35%),15 (25%),2 (25%),11 (25%) and 14 (25%). The remaining 12 criteria were rated as "Low." The criteria included in the "Low" rating were as follows: 4 (20%),10 (20%),12 (20%),16 (20%),20 (19%),9 (15%),17 (15%),18 (10%),21 (10%),24 (10%),22 (0%) and 23 (0%).

Students = 20

Students rated criterion 7 (75%) as "High." They included 12 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 5 (55%),16 (55%),1 (50%),3 (50%),6 (40%),19 (40%),4 (35%),20 (35%),2 (30%),13 (30%),15 (30%) and 18 (30%). The remaining 11 criteria were rated as "Low." The criteria included in the "Low" rating were as follows: 14 (20%), 12 (15%),21 (15%),24 (15%),8 (10%),11 (10%),17 (10%),22 (10%),10 (5%),9 (0%) and 23 (0%).

Apart from two criteria for the teachers and one criterion for the students in the "High" category, the majority of the respondents had their statements in the "Low" category.

Table 30

Participants Ratings: Components of the Instructional Program Facilities and Equipment - (Supplies and Equipment)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Variety of equipment and supplies available														
	P	0	0	2	20	3	30	4	40	1	10	0	0	10
	DH	0	0	1	10	4	40	4	40	1	10	0	0	10
	T	1	5	1	5	7	35	8	40	3	15	0	0	20
	S	1	5	7	35	6	30	3	15	3	15	0	0	20
2. Appropriate audiovisual equipment available														
	P	0	0	2	20	3	30	5	50	0	0	0	0	10
	DH	1	10	0	0	4	40	4	40	1	10	0	0	10
	T	0	0	3	15	7	35	8	40	2	10	0	0	20
	S	0	0	5	25	9	45	5	25	1	5	0	0	20

3. Adequate chalkboards, bulletin boards provision

P	0	0	5	50	5	50	0	0	0	0	0	0	10
DH	1	10	4	40	3	30	2	20	0	0	0	0	10
T	2	10	5	25	10	50	3	15	0	0	0	0	20
S	2	10	6	30	8	40	4	20	0	0	0	0	20

4. Adequate supplies, equipment available for instruction

P	0	0	1	10	5	50	4	40	0	0	0	0	10
DH	0	0	0	0	4	40	5	50	1	10	0	0	10
T	0	0	2	10	8	40	9	45	1	5	0	0	20
S	0	0	4	20	7	35	7	35	2	10	0	0	20

5. Well-maintained equipment, meeting safety requirements

P	0	0	4	40	5	50	1	10	0	0	0	0	10
DH	1	10	1	10	6	60	2	20	0	0	0	0	10
T	2	10	3	15	9	45	6	30	0	0	0	0	20
S	0	0	9	45	10	50	1	5	0	0	0	0	20

6. Safety guards remain in place, except when the equipment is under repair

P	0	0	2	20	8	80	0	0	0	0	0	0	10
DH	1	10	3	30	5	50	1	10	0	0	0	0	10
T	3	15	6	30	10	50	1	10	0	0	0	0	20
S	2	10	8	40	8	40	2	10	0	0	0	0	20

Table 30 (continued)

Participants Ratings: Components of the Instructional Program Facilities and Equipment - (Supplies and Equipment)

Medium Size Schools

7. All machine tools are provided with safety guards													
P	0	0	3	30	5	50	2	20	0	0	0	0	10
DH	1	10	1	10	5	50	3	30	0	0	0	0	10
T	3	15	4	20	9	45	4	20	0	0	0	0	20
S	2	10	8	40	7	35	3	15	0	0	0	0	20
8. Unsafe instrument being removed from service, visibly marked													
P	0	0	3	30	6	60	1	10	0	0	0	0	10
DH	1	10	4	40	3	30	2	20	0	0	0	0	10
T	5	25	8	40	2	10	5	25	0	0	0	0	20
S	4	20	7	35	9	45	0	0	0	0	0	0	20
9. Magnetic control switches, braking devices provision for appropriate machines													
P	0	0	2	20	6	60	2	20	0	0	0	0	10
DH	0	0	4	40	5	50	1	10	0	0	0	0	10
T	2	10	7	35	9	45	2	10	0	0	0	0	20
S	1	5	8	40	8	40	3	15	0	0	0	0	20

10. Eye protection devices provided for persons exposed to eye injury conditions

P	0	0	1	10	4	40	4	40	1	10	0	0	10
DH	0	0	2	20	3	30	2	20	3	30	0	0	10
T	0	0	3	35	7	35	7	35	3	15	0	0	20
S	3	15	2	10	5	25	6	30	4	20	0	0	20

11. Ear protection provided for persons exposed to ear damage conditions

P	0	0	0	0	4	40	2	20	4	40	0	0	10
DH	1	8	0	0	3	30	4	40	3	30	0	0	10
T	0	0	2	10	5	25	7	35	6	30	0	0	20
S	0	0	3	15	3	15	6	30	8	40	0	0	20

12. Respiratory protection devices provision

P	0	0	2	20	2	20	4	40	4	40	0	0	10
DH	0	0	1	10	3	30	5	50	1	10	0	0	10
T	0	0	3	15	3	15	9	45	5	25	0	0	20
S	0	0	2	10	6	30	8	40	4	20	0	0	20

13. Head protection devices provision

P	0	0	0	0	4	40	4	40	2	20	0	0	10
DH	0	0	0	0	3	30	6	60	1	10	0	0	10
T	0	0	4	20	5	25	6	30	5	25	0	0	20
S	0	0	3	15	4	20	5	25	8	40	0	0	20

Table 30 (continued)

Participants Ratings: Components of the Instructional Program Facilities and Equipment - (Supplies and Equipment)

Medium Size Schools

14. Appropriate clothing worn by teachers and students when exposed to conditions warrant												
P	0	0	2	20	5	50	3	30	0	0	0	0	10
DH	1	10	1	10	5	50	3	30	0	0	0	0	10
T	3	15	8	40	5	25	4	20	0	0	0	0	20
S	0	0	4	20	11	55	5	25	0	0	0	0	20
15. Personal protection devices sanitized after each use												
P	0	0	3	30	4	40	3	30	0	0	0	0	10
DH	0	0	1	10	4	40	2	20	3	30	0	0	10
T	0	0	3	15	6	30	7	35	4	20	0	0	20
S	0	0	3	15	5	25	6	30	6	30	0	0	20
16. Corrective, preventive maintenance performed within reasonable time												
P	0	0	1	10	4	40	5	50	0	0	0	0	10
DH	0	0	2	20	3	30	4	40	1	10	0	0	10
T	0	0	4	20	5	25	6	30	5	25	0	0	20
S	0	0	5	25	5	25	7	35	3	15	0	0	20

17. Appropriate furniture for instruction provision													
P	0	0	3	30	5	50	2	20	0	0	0	0	10
DH	0	0	1	10	6	60	3	30	0	0	0	0	10
T	0	0	6	30	10	50	4	20	0	0	0	0	20
S	2	10	8	40	5	25	5	25	0	0	0	0	20
18. Machines placed, mounted in safe, functional manner													
P	0	0	3	30	6	60	1	10	0	0	0	0	10
DH	1	10	2	20	5	50	2	20	0	0	0	0	10
T	3	15	7	35	10	50	0	0	0	0	0	0	20
S	5	25	6	30	6	30	3	15	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Facilities and Equipment - (Supplies and Equipment)

Table 30 presents the frequencies and percentages for each of the 18 statements directed at industrial arts supplies and equipment in the 10 medium size schools.

Principles = 10

There were 18 criteria in this section. The principals rated 7 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 3 (50%),5 (40%),18 (30%),17 (30%),7 (30%),8 (30%) and 15 (30%). The remaining 11 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 1 (20%),2 (20%),12 (20%),6 (20%),9 (20%),14 (20%),4 (10%),10 (10%),16 (10%),11 (0%) and 13 (0%).

Department Heads = 10

The department heads rated 5 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 3 (50%),8 (50%),6 (40%),9 (40%) and 18 (30%). The remaining 13 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 5 (20%),7 (20%),16 (20%),10 (20%),14 (20%),1 (10%),2 (10%),12 (10%),17 (10%),15 (10%),11 (8%), 4 (0%) and 13 (0%).

Teachers = 20

The teachers rated 10 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 8 (65%),14 (55%),18 (50%),6 (45%),9 (45%),3 (35%),7 (35%),10 (35%),17

(30%) and 5 (25%). The remaining 8 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 13 (20%),16 (20%),2 (15%),12 (15%),15 (15%),1 (10%),4 (10%) and 11 (10%).

Students = 20

The students rated 12 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 8 (55%),18 (55%),6 (50%),7 (50%),17 (50%),5 (45%),9 (45%), 1 (40%), 3 (40%), 2 (25%), 10 (25%) and 16 (25%). The remaining 6 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 4 (20%),14 (20%),5 (15%),11 (15%),13 (15%) and 12 (10%).

The majority of the statements for all respondents were in the "Low" category. None of the respondents ranked any criteria as "High."

Table 31

Participants Ratings: Components of the Instructional Program - Facilities and Equipment: Supplies and Equipment (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 20
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Facilities, equipment conducive to objectives achievement														
	P	0	0	3	30	5	50	2	20	0	0	0	0	10
	DH	3	30	4	40	3	30	0	0	0	0	0	0	10
	T	7	35	6	30	5	25	2	10	0	0	0	0	20
	S	0	0	8	40	11	55	1	5	0	0	0	0	20
2. Adequate instructional space provided														
	P	0	0	2	20	3	30	4	40	1	10	0	0	10
	DH	0	0	1	10	4	40	4	40	1	10	0	0	10
	T	0	0	5	25	5	25	7	35	3	15	0	0	20
	S	0	0	3	15	6	30	9	45	2	10	0	0	20

3. Adequate instructional equipment, facilities provided

P	0	0	0	0	3	30	6	60	1	10	0	0	10
DH	0	0	1	10	2	20	5	50	2	20	0	0	10
T	0	0	2	10	6	30	7	35	5	25	0	0	20
S	0	0	3	15	5	25	9	45	3	15	0	0	20

4. Facilities, equipment effectively used for instructional activities

P	0	0	5	50	4	40	1	10	0	0	0	0	10
DH	1	10	4	40	3	30	2	20	0	0	0	0	10
T	2	10	3	15	10	50	5	25	0	0	0	0	20
S	1	5	5	25	11	55	3	15	0	0	0	0	20

5. Adequate storage facilities for supplies, equipment

P	0	0	2	20	2	20	5	50	1	10	0	0	10
DH	0	0	1	10	3	30	3	30	3	30	0	0	10
T	0	0	5	25	4	20	7	35	4	20	0	0	20
S	0	0	4	20	5	25	8	40	3	15	0	0	20

6. Equipment well-maintained for efficient use

P	0	0	3	30	2	20	4	40	1	10	0	0	10
DH	0	0	2	20	3	30	3	30	2	20	0	0	10
T	0	0	3	15	5	25	9	45	3	15	0	0	20
S	1	5	6	30	11	55	2	10	0	0	0	0	20

Table 31 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment: Supplies and Equipment (Evaluation)

Medium Size Schools

7. Laboratories adequately maintained														
	P	0	0	2	20	3	30	4	40	1	10	0	0	10
	DH	0	0	3	30	2	20	3	30	2	20	0	0	10
	T	0	0	5	25	4	20	8	40	3	15	0	0	20
	S	0	0	1	5	8	40	7	35	4	20	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Student

Components of the Instructional Program - Facilities and Equipment: Supplies and Equipment (Evaluation).

Table 31 presents the frequencies and percentages for each of the 7 statements directed at evaluation of industrial arts facilities and equipment in the 10 medium size schools.

Principles = 10

There were 18 criteria in this section. The principals rated 7 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 3 (50%),5 (40%),18 (30%),17 (30%),7 (30%),8 (30%) and 15 (30%). The remaining 11 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 1 (20%),2 (20%),12 (20%),6 (20%),9 (20%),14 (20%),4 (10%),10 (10%),16 (10%),11 (0%) and 13 (0%).

Department Heads = 10

The department heads rated 5 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 3 (50%),8 (50%),6 (40%),9 (40%) and 18 (30%). The remaining 13 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 5 (20%),7 (20%),16 (20%),10 (20%),14 (20%),1 (10%),2 (10%),12 (10%),17 (10%),15 (10%),11 (8%), 4 (0%) and 13 (0%).

Teachers = 20

The teachers rated 10 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 8 (65%),14 (55%),18 (50%),6 (45%),9 (45%),3 (35%),7 (35%),10 (35%),17 (30%) and 5 (25%). The remaining 8 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 13 (20%),16 (20%),2 (15%),12 (15%),15 (15%),1 (10%),4 (10%) and 11 (10%).

Students = 20

The students rated 12 criteria as "Adequate." The "Adequate" ratings in rank order were as follows: 8 (55%),18 (55%),6 (50%),7 (50%),17 (50%),5 (45%),9 (45%), 1 (40%), 3 (40%), 2 (25%), 10 (25%) and 16 (25%). The remaining 6 criteria were rated as "Low." The rank order of these "Low" ratings was as follows: 4 (20%),14 (20%),5 (15%),11 (15%),13 (15%) and 12 (10%).

The majority of the statements for the respondents were in the "Low" category. None of the respondents ranked any criteria as "High."

Comments on Facilities and Equipment

Principals

- There were nine principals who commented that the maintenance and general cleanliness of their school shops was inadequate and needed immediate improvement.

- There were eight principals who commented that the space for instructional activities in their shops was inadequate to meet the needs of all students who wished to take industrial arts courses.

- Seven principals commented that the industrial arts shops in their schools were equipped with inadequate equipment and facilities for instructional activities.

- Five principals stated that the industrial arts facilities that were available in their schools did not correlate with current advances in technology. As a consequence, these facilities needed to be renovated or replaced.

- Three principals made the comment that the industrial arts shops in their schools had inadequate storage facilities where supplies and equipment could be stored.

Department Heads

- There were eight department heads who made the comment that some of the machines in their shops were inoperable because of missing parts. Parts for these machines were not readily available.

- Six department heads commented that the equipment in their school shops needed to be better maintained for efficient use with instructional activities.

- Five department heads reported that their industrial arts staff needed to be trained in equipment maintenance so they could repair equipment when the need arose.

Teachers

- Eight industrial arts teachers commented that their school shops were equipped with facilities and equipment that was sub-standard and not up-to-date with current developments in technology.

- Seven industrial arts teachers commented that some of the equipment in their shops was not meeting the needs of their schools. As a result, this equipment was not being used.

- From their comments it was evident that four industrial arts teachers did not have adequate space for instructional activities that would serve the needs of all students who wished to take industrial arts courses in their schools.

Student

- There were 11 students who commented that the industrial arts shops in their schools needed additional working space, tools, equipment, materials, first aids kits, and storage rooms to meet the demands for industrial arts programs in their schools.

- There were nine students who through their comments recommended that their schools provide students with lockers in which to keep materials, personal belongings and unfinished projects.

- Three students commented that personal protection devices were inadequately provided for the safety and protection of all industrial arts students in their industrial arts shops.

Table 32
Participants Ratings: Learning Climate
Medium Size Schools

N = P 10
DH 10
T 20
S 20

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Objectives reflect a clear sense of purpose														
	P	1	10	4	36	5	45	1	10	0	0	0	0	11
	DH	3	30	3	30	3	30	1	10	0	0	0	0	10
	T	3	15	8	40	7	35	2	10	0	0	0	0	20
	S	1	5	12	60	5	25	2	10	0	0	0	0	20
2. Competent, dedicated faculty														
	P	1	10	5	50	3	30	1	10	0	0	0	0	10
	DH	2	20	4	40	3	30	1	10	0	0	0	0	10
	T	2	10	9	45	7	35	2	10	0	0	0	0	20
	S	4	20	9	45	4	20	3	15	0	0	0	0	20

3. School administration provides adequate resources, encouragement

P	2	20	5	50	3	30	0	0	0	0	0	0	10
DH	0	0	3	30	4	10	2	20	1	10	0	0	10
T	0	0	5	25	8	40	5	25	2	10	0	0	20
S	0	0	5	25	10	50	3	15	2	10	0	0	20

4. High student achievement expected by administration and staff

P	1	10	5	50	3	30	1	10	0	0	0	0	10
DH	0	0	4	40	4	40	2	20	0	0	0	0	10
T	1	5	5	25	6	30	5	25	3	15	0	0	20
S	2	10	6	30	4	20	6	30	2	10	0	0	20

5. Parents, community support exists for program

P	0	0	2	20	3	30	3	30	2	20	0	0	10
DH	0	0	1	10	4	40	4	40	1	10	0	0	10
T	0	0	3	15	7	35	8	40	2	10	0	0	20
S	2	10	7	35	8	40	3	15	0	0	0	0	20

6. Instructional program based on appropriate diagnosis of students' developmental characteristics

P	2	18	3	27	4	36	2	18	0	0	0	0	11
DH	1	10	5	50	4	40	0	0	0	0	0	0	10
T	2	10	10	50	7	35	1	5	0	0	0	0	20
S	3	15	6	30	9	45	2	10	0	0	0	0	20

Table 32 (continued)

Participants Ratings: Learning Climate

Medium Size Schools

7. Student placement predicated on faculty advisement, individual student plans

P	1	10	4	40	5	50	0	0	0	0	0	0	10
DH	2	20	5	50	2	20	1	10	0	0	0	0	10
T	2	10	9	45	4	20	5	25	0	0	0	0	20
S	1	5	12	60	7	35	0	0	0	0	0	0	20

8. Classroom organization provides for optimum use of instructional time

P	0	0	5	50	4	40	1	10	0	0	0	0	10
DH	2	20	4	40	2	20	2	20	0	0	0	0	10
T	5	25	7	35	5	25	3	15	0	0	0	0	20
S	3	15	11	55	4	20	2	10	0	0	0	0	20

9. Instructional methods facilitate individual student performance

P	1	10	3	30	5	50	1	10	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	2	10	9	45	6	30	3	15	0	0	0	0	20
S	4	20	7	35	7	35	2	10	0	0	0	0	20

10. All students are given opportunity to achieve required program and individual goals

P	0	0	5	50	4	40	1	10	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	3	15	8	40	7	35	2	10	0	0	0	0	20
S	3	15	10	50	5	25	2	10	0	0	0	0	20

11. Frequent feedback on students' performance provided

P	0	0	5	50	4	40	1	10	0	0	0	0	10
DH	2	20	6	60	0	0	2	20	0	0	0	0	10
T	6	30	9	45	3	15	2	10	0	0	0	0	20
S	3	15	11	55	4	20	2	10	0	0	0	0	20

12. Appraisal of teacher performance oriented toward instructional improvement

P	1	10	4	40	5	50	0	0	0	0	0	0	10
DH	1	10	5	45	3	27	2	18	0	0	0	0	11
T	7	35	4	20	5	25	4	20	0	0	0	0	20
S	1	5	7	35	9	45	3	15	0	0	0	0	20

13. Students! self-esteem enchanced by positive relationships among peers, teachers

P	1	10	5	45	5	45	0	0	0	0	0	0	11
DH	3	30	3	30	3	30	1	10	0	0	0	0	10
T	5	25	10	50	4	20	1	5	0	0	0	0	20
S	4	20	11	55	3	15	2	10	0	0	0	0	20

Table 32 (continued)

Participants Ratings: Learning Climate

Medium Size Schools

14. School classroom disciplinary standards promote positive learning environment

P	2	10	3	30	5	50	0	0	0	0	0	0	10
DH	1	10	5	50	3	30	1	10	0	0	0	0	10
T	3	15	9	45	7	35	1	5	0	0	0	0	20
S	1	5	10	50	7	35	2	10	0	0	0	0	20

15. Students, teachers are recognized for achieving program objectives

P	1	10	5	50	3	30	1	10	0	0	0	0	10
DH	4	40	2	20	3	30	1	10	0	0	0	0	10
T	1	5	10	50	4	20	5	25	0	0	0	0	20
S	5	25	8	40	4	20	3	15	0	0	0	0	20

16. Facilities pleasing, functional, safe and properly maintained													
	P	0	0	1	10	3	30	3	30	3	30	0	0	10
	DH	0	0	2	20	2	20	4	40	2	20	0	0	10
	T	0	0	5	25	2	10	9	45	4	20	0	0	20
	S	0	0	2	10	7	35	8	40	3	15	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Learning Climate

Table 32 presents frequencies and percentages for each of the 16 statements directed at learning climate in the industrial arts programs in the 10 medium size participating schools.

Principles = 10

There were 16 criteria in this section. The principals rated all but 2 of the criteria as "Adequate." The two exceptions were 5 (20%) and 16 (10%) which were rated as "Low." The remaining 14 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 3 (70%), 15 (60%), 2 (60%), 4 (60%), 13 (55%), 7 (50%), 8 (50%), 12 (50%), 10 (50%), 11 (50%), 1 (46%), 6 (45%), 9 (40%) and 14 (40%).

Department Heads = 10

The department heads rated criterion 11 (80%) as "High." Criteria 16 (20%) and 5 (10%) were ranked as "Low." The remaining 13 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 7 (70%),15 (60%),13 (60%),9 (60%),1 (60%),2 (60%),6 (60%),8 (60%),10 (50%),14 (60%),12 (55%),4 (40%) and 3 (30%).

Teachers = 20

The teachers rated two criteria 11 (75%) and 13 (75%) in the "High" category. In the "Low" category only 5 (15%) was assessed. The rest of the 13 criteria were ranked as "Adequate." Their ratings in rank order were as follows: 6 (60%),8 (60%),14 (60%),10 (55%),12 (55%),7 (55%),9 (55%),2 (55%),1 (55%),15 (55%),4 (30%), 3 (25%) and 16 (25%).

Students = 20

The students ranked only criterion 13 (75%) as "High", and criterion 16 (10%) as "Low." They included the remaining 14 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 8 (70%),11 (70%),15 (65%),7 (65%),1 (65%),2 (65%),10 (65%),9 (55%),14 (55%),5 (45%),6 (45%),4 (40%),12 (40%) and 3 (25%)

The department heads, teachers and students indicated at least one criteria in the "High" category. All the respondents had at least one criteria in the "Low" section.

Table 33

Participants Ratings: Learning Climate (Evaluation)

Medium Size Schools

N = P 10
DH 10
T 10
S 20

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Learning climate support attainment of program objectives														
	P	1	10	5	50	3	30	1	10	0	0	0	0	10
	DH	2	20	4	40	3	30	1	10	0	0	0	0	10
	T	5	25	7	35	7	35	1	5	0	0	0	0	20
	S	1	5	11	55	5	25	3	15	0	0	0	0	20
2. Learning climate foster individual student satisfaction, self-esteem														
	P	2	20	4	40	2	20	2	20	0	0	0	0	10
	DH	4	40	2	20	3	30	1	10	0	0	0	0	10
	T	2	10	9	45	5	25	4	20	0	0	0	0	20
	S	2	10	10	50	7	35	1	5	0	0	0	0	20

3. Learning climate foster individual student achievement

P	1	10	5	50	3	30	1	10	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	3	15	9	45	8	40	0	0	0	0	0	0	20
S	2	10	8	40	10	50	0	0	0	0	0	0	20

4. Program evaluated, revised regularly to meet content and student need

P	0	0	1	10	4	40	3	30	2	20	0	0	10
DH	0	0	2	20	2	20	4	40	2	20	0	0	10
T	0	0	4	20	5	25	8	40	3	15	0	0	20
S	0	0	2	10	7	35	9	45	2	10	0	0	20

5. To what degree do the following groups have a positive perception of learning climate:

a. students

P	1	10	2	20	5	50	2	20	0	0	0	0	10
DH	2	20	4	40	1	10	3	30	0	0	0	0	10
T	5	25	4	20	10	50	1	5	0	0	0	0	20
S	3	15	8	40	7	35	2	10	0	0	0	0	20

b. teachers

P	1	10	5	50	4	40	0	0	0	0	0	0	10
DH	2	20	4	40	3	30	1	10	0	0	0	0	10
T	6	30	5	25	8	40	1	5	0	0	0	0	20
S	0	0	12	60	6	30	2	10	0	0	0	0	20

Table 33 (continued)

Participants Ratings: Learning Climate (Evaluation)

Medium Size Schools

c. parents and community													
P	0	0	2	20	3	30	4	40	1	10	0	0	10
DH	0	0	1	10	4	40	3	30	2	20	0	0	10
T	0	0	4	20	5	25	9	45	2	10	0	0	20
S	2	10	0	0	7	35	8	40	3	15	0	0	20
d. school administration													
P	1	10	5	50	4	40	0	0	0	0	0	0	10
DH	2	20	4	40	4	40	0	0	0	0	0	0	10
T	3	15	8	40	4	20	5	25	0	0	0	0	20
S	2	10	6	30	10	50	2	10	0	0	0	0	20
e. district administration													
P	2	20	3	30	5	50	0	0	0	0	0	0	10
DH	0	0	4	40	4	40	2	20	0	0	0	0	10
T	3	15	2	10	8	40	7	35	0	0	0	0	20
S	2	12	7	42	7	42	1	5	0	0	0	0	17

f. the Ministry of Education

P	0	0	6	60	4	40	0	0	0	0	0	0	10
DH	0	0	5	50	4	40	1	10	0	0	0	0	10
T	3	15	8	40	6	30	3	15	0	0	0	0	20
S	5	25	7	35	7	35	1	5	0	0	0	0	20

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Learning Climate (Evaluation)

Table 33 presents frequencies and percentages for each of the 10 evaluation statements directed at the industrial arts learning climate in the 10 medium size schools that were involved in the research.

Principles = 10

There were 10 criteria in this section. The principals rated all but two of the criteria as "Adequate." Criteria 5c (20%) and 4 (10%) were located in the "Low" category. The remaining 8 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 5d (60%),5f (60%),1 (60%),2 (60%),3 (60%),5b (60%),5a (60%) and 5e (40%)

Department Heads = 10

The department heads rated two criteria 4 (20%) and 5c (10%) as "Low." The remaining 8 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 5d (60%),5f (60%),1 (60%),2 (60%),3 (60%),5b (60%),5e (50%) and 5a (30%)

Teachers = 10

The teachers rated two criteria 4 (20%) and 5c (20%) as "Low." The remaining 8 criteria were rated as "Adequate." Their ratings in rank order were as follows: 5d (60%),1 (60%),3 (60%),5f (55%),2 (55%),5b (55%),5a (45%) and 5e (25%)

Students = 20

The students rated two criteria 4 (10%) and 5c (10%) as "Low." They included the remaining 8 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 5f (60%),1 (60%),2 (60%),5b (60%),5a (55%), 5e (54%),3 (50%) and 5d (40%)

All the subjects ranked the same criteria 5c and 4 as "Low". None of the subject groups had any of the criteria ranked in the "High" category.

Comments on Learning Climate

Principals

- Eight principals commented that their industrial arts faculty were competent and dedicated; however, their school still had inadequate equipment and facilities to create a positive learning climate for the industrial arts program.

- Seven principals by their comments made the explicit suggestion that the industrial arts programs in their schools be evaluated every five years in terms of course content and student needs. Programs should be revised accordingly and brought up-to-date so a positive learning climate could be maintained.

- Six principals suggested that in order to improve the learning climate for industrial arts, their facilities must be functional and properly maintained. This could be achieved if the Department of General Education would provide secondary schools with acceptable standards for equipment and facilities.

- Five principals commented that classroom disciplinary standards in their schools were used by industrial arts teachers to create a pleasing learning environment where students were kept on task.

Department Heads

- Nine department heads commented that the learning climate in the industrial arts programs in their schools could be improved providing the Department of General Education would provide their schools with adequate facilities and equipment for the industrial arts programs.

- Six department heads commented that the industrial arts programs in their schools received the full support of the parents and the community since the majority of their students left school to find employment after a lower level of secondary schooling.

- Four department heads commented that their departments were making every effort to have an industrial arts facility that was functioning properly and one that was safely maintained.

Teachers

- Eight industrial arts teachers commented that their school administrators provided full support to the industrial arts program in terms of equipment and facilities because these administrators were aware that the majority of the students in their schools would leave school after completing lower level secondary school to seek some type of employment.

- Seven industrial arts teachers made the comment that because their school shops lacked both sufficient facilities and budget to support this program, they found it necessary to improve the learning climate of the industrial arts program by making every effort to use community resources to supplement their instructional activities.

- From their comments four teachers made recommendations that the learning climate for the industrial arts programs in their schools could be improved providing the Department of General Education would equip the industrial arts shops with adequate equipment and facilities that would keep all students in class busy with some form of activity.

Students

- Seven students commented that the unpleasant atmosphere in their school shops was the result of inadequate ventilation. This they felt created a negative learning climate.

- Seven students recommended that the learning climate of the industrial arts activities of their schools could be improved if adequate utilities were installed.

- Four students recommended that their teachers provide them with more frequent feedback about their achievement.

Summary - Medium Schools

Since section "VII. Evaluation Summary and Suggestions" of the NSSE instrument was not used with the medium-size schools, this summary is a synthesis of participant comments as gathered from the various open ended comments provided in other sections of the questionnaire.

There was general consensus among the stakeholders (principals, department heads, teachers and students) that there was inadequate financial support for industrial arts programs and that it would be desirable to make more use of community partnerships, resources and people resources. Community partnerships had the potential to enrich the programs being offered.

There was an interest expressed by all stakeholders to meet student needs in industrial arts programming. Concerns centered around both student access to programs and the rigidity of existing programs. Although most school personnel suggested that they were making every attempt to provide a program that would allow students to make an effective transition from school to the work place, this was not always possible. There was a feeling that the technology available in society had surpassed that available in the schools.

Stakeholders felt that although the industrial arts staff was generally competent many of them did lack current knowledge in some areas of the industrial arts program. The responses implied that some staff might be having problems keeping abreast of current educational developments. There was a general appeal from principals, department heads and teachers for more in-servicing in the industrial arts area. It was suggested that this in-servicing should be tied to new advances in technology. In this same vein, there was a need expressed for a centrally located meeting center that would facilitate the exchange of ideas among industrial arts teachers.

When considering instructional activities in the industrial arts program there was some concern about whether or not teachers were obtaining appropriate, up-to-date materials. This was linked to the notion that perhaps industrial arts teachers and programs should be making more use of community resources to supplement instruction. Some schools that had tried to make use of community resources reported receiving excellent support from the community in this venture.

Concern was expressed about the lack of availability of industrial arts reading materials (both in quantity and quality) in schools. There was also a general plea for more resource material, study guides and other support material for the instructional program. It was acknowledged that these materials would have to be accessible to both students and teachers (both during and after class) and be well organized if they were to achieve maximum benefit. It was suggested that this would be problematic because of the lack of storage space available in most of the industrial arts shop areas.

There seemed to some concern that more explicit evaluative criteria should be available for student assessment in the industrial arts area. It was suggested by all stakeholders that attitudes and proper safety habits as well as skills should be a normal part of student evaluation in industrial arts courses. It was felt that there was too much focus on the final products being produced. In addition, practical aspects of the subject and not just scores on paper-pencil tests should form a basis for evaluating student performance.

Stakeholders point out what they saw many deficiencies in the area of facilities. Not only were industrial arts classes often overcrowded, in many instances, facilities were perceived as having major shortcomings. There was often inadequate space for demonstration and discussion, improper exhaust equipment, and a lack of non-skid floors in the area of working machines. There was also a general appeal for more storage space for projects and display cases for proper display of finished projects.

Maintenance of equipment was generally perceived as problematic since teachers are not well prepared in this area. A number of schools had machines that were inoperable because of missing parts. It was also often noted that parts for these machines were not readily available. There was also a common perception that many industrial arts facilities needed to be upgraded in terms of current technological advances.

When exploring the learning climate the stakeholders reported that parent and community support for industrial arts programs was not particularly high. There was also the suggestion that industrial arts programs should be evaluated on a regular basis and revised accordingly. It was felt that this would do much for improving the general learning climate in the industrial arts program. Inadequate facilities and equipment were also cited as common reason for a less than ideal learning climate in some industrial arts classrooms.

Large Size Schools

The data and analysis that follow are representative of the large size schools involved in this study.

Table 34

Participants Ratings: Organization for Instruction

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Current rationale developed														
	P	1	8	8	66	3	25	0	0	0	0	0	0	12
	DH	3	27	6	54	0	0	2	18	0	0	0	0	11
	T	4	17	10	41	4	17	6	25	0	0	0	0	24
	S	8	33	13	54	3	12	0	0	0	0	0	0	24
2. Philosophy, goals, objectives cooperatively developed														
	P	1	8	2	17	5	41	4	33	0	0	0	0	12
	DH	3	25	0	0	7	58	2	17	0	0	0	0	12
	T	4	17	5	20	4	17	5	20	4	17	2	8	24
	S	7	30	11	48	4	17	1	4	0	0	0	0	23

3. Philosophy, goals, objectives, consistent with local, national philosophies													
P	1	9	7	63	2	18	1	9	0	0	0	0	11
DH	3	25	3	25	4	33	2	17	0	0	0	0	12
T	3	12	9	37	9	37	3	12	0	0	0	0	24
S	9	40	7	31	6	27	0	0	0	0	0	0	22
4. Philosophy goals used for planning and evaluation													
P	1	8	5	41	5	41	1	8	0	0	0	0	12
DH	1	8	3	25	6	50	2	17	0	0	0	0	12
T	4	17	10	41	10	41	0	0	0	0	0	0	24
S	4	17	14	61	5	21	0	0	0	0	0	0	23
5. Philosophy, goals objectives periodically reviewed, revised													
P	2	17	2	17	5	41	3	25	0	0	0	0	12
DH	3	25	3	25	3	25	1	8	2	17	0	0	12
T	2	8	7	29	6	25	5	20	2	8	2	8	24
S	1	4	9	39	8	34	4	17	1	4	0	0	23
6. Courses represented four broad systems													
P	0	0	4	33	5	41	3	25	0	0	0	0	12
DH	3	25	5	41	3	25	1	8	0	0	0	0	12
T	6	25	6	25	3	12	6	25	3	12	0	0	24
S	6	25	7	29	10	41	1	4	0	0	0	0	24

Table 34 (continued)

Participants Ratings: Organization for Instruction

Large Size Schools

7. Courses planned to achieve objectives													
	P	0	0	3	25	6	50	2	17	1	8	0	0	12
	DH	4	33	2	17	3	25	2	17	1	8	0	0	12
	T	5	20	3	12	6	25	8	33	2	8	0	0	24
	S	8	33	10	41	3	12	2	8	1	4	0	0	24
8. Program serves all students														
	P	2	17	4	33	3	25	3	25	0	0	0	0	12
	DH	2	17	4	33	2	17	3	25	1	8	0	0	12
	T	5	20	4	17	7	29	4	17	4	17	0	0	24
	S	11	45	6	25	6	25	0	0	1	4	0	0	24
9. Program up-dated regularly														
	P	0	0	3	25	7	58	2	17	0	0	0	0	12
	DH	2	17	2	17	6	50	1	8	1	8	0	0	12
	T	5	20	5	20	7	29	4	17	3	12	0	0	24
	S	2	8	12	50	5	20	3	12	2	8	0	0	24
10. Sufficient funds available to achieve program's goals and needs														
	P	1	8	2	17	7	58	2	17	0	0	0	0	12
	DH	1	8	6	50	2	17	2	15	1	8	0	0	12
	T	3	12	5	20	9	37	4	17	3	12	0	0	24
	S	3	12	5	20	8	33	4	17	4	17	0	0	24

11. Adequate support services to support program													
P	0	0	4	33	5	41	2	17	1	8	0	0	12
DH	1	8	5	41	3	25	2	17	1	8	0	0	12
T	2	8	2	8	7	29	9	37	4	17	0	0	24
S	0	0	8	33	7	29	3	12	6	25	0	0	24
12. Community people used to achieve program goals													
P	0	0	3	25	4	33	4	33	0	0	1	8	12
DH	3	25	1	8	3	25	4	33	0	0	1	8	12
T	2	8	2	8	4	17	8	33	6	25	1	4	25
S	0	0	5	22	5	22	5	22	7	31	0	0	22
13. Advisory committee used to achieve program goals													
P	0	0	2	17	7	58	2	17	1	8	0	0	12
DH	1	8	2	17	4	33	3	25	1	8	1	8	12
T	3	12	3	12	4	17	7	29	6	25	1	4	24
S	3	12	4	17	12	50	3	12	2	8	0	0	24

Table 34 (continued)

Participants Ratings: Organization for Instruction

Large Size Schools

14. Opportunity for community partners to participate in program

P	0	0	2	17	3	25	4	33	3	25	0	0	12
DH	2	17	0	0	4	33	2	17	4	33	0	0	12
T	0	0	3	12	6	25	6	25	7	29	2	8	24
S	2	8	7	29	5	20	6	25	4	17	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Organization for Instruction

Table 34 presents the frequencies and percentages for each of the 14 items directed at the course offerings in the industrial arts programs in the 12 large size schools involved in this study.

Principals = 12

Of the 14 criteria that complied this portion of the instrument, 1 of these criterion was rated either 5, excellent, or 4, good, by a combined percent of 75 of the principals from small size schools. This was criterion 1. As a result of this rating this criterion was placed in the "High" category. The 13 remaining criteria were rated either 5 or 4 but their combined percentage was less than 75 % which placed these criteria in the "Adequate" category. In rank order these criteria were 3 (72%), 8 (50%), 4 (49%), 2 (35%), 5 (34%), 6 and 11 (33%), and 7, 9, 10, and 12 each with a percentage of 25. These 11 criteria because of their rating were considered to fail to meet accreditation program standards. These criteria must receive the immediate attention of the Department of General Education if industrial arts is to remain a viable subject area at the secondary school level. Criteria 13 and 14 (17%%) were categorized as "Low."

Department Heads = 12

The 12 department heads rated 1 of the 12 criteria either 5 or 4 with combined percentages of 75 or higher. Criterion 1 (81%) was categorized as "High." The percentage of 12 of the remaining 13 criteria fell within the range of 25 to 74% placing these criteria in the "Adequate" category. In rank order these criteria were: 6 (66%), 8 (58%), 3, 5, 7 and 8 (50%), 11 (49%), 9 (34%), 4 and 12 (33%), and 2 and 13 (25%). One of the 14 criteria, 14 (17%) was placed in the "Low" category.

Teachers = 24

The 24 teachers rated none of the 14 criteria either 5 or 4 with combined percentages of 75 or higher so none of the criteria were categorized as "High." The percentage of eight of the remaining 14 criteria fell within the range of 25 to 74% placing these criteria in the "Adequate" category. In rank order these criteria were: 1 and 4 (58%), 6 (50%), 3 (49%), 9 (40%), 5 and 8 (37%), 2 (35%), and 7 and 10 (32%). These criteria help to formulate and direct the philosophical foundation for industrial arts and need to be scrutinized by the Department of General Education. Three of the 14 criteria, 13 (24%), 11 and 12 (16%), and 2 14 (12%) were placed in the "Low" category.

Students = 24

Students rated 4 of the 14 criteria 5 or 4 with combined percentages of 75 to 100%. Criteria 1 (87%), 2 and 4 (78%)

and 8 (75%) were categorized as "High." Nine of the remaining 10 criteria had a combined percentage that fell within the 25 to 74% range automatically placing each of these criteria in the category of "Adequate." In rank order these criteria were: 7 (74%), 3 (71%), 9 (58%), 6(54%), 5 (43%), 14 (37%),11 (33%), 10 (32%), and 13 (29%). Criterion 12 (22%) was placed in the "Low" category

The above analysis shows that both the principals and department heads by their ratings placed 1 of the 14 criteria in the "High" category while the students placed 4 of the criteria in that category. The teacher group did not place any of the criteria in the "High" category.

Table 35

Participants Ratings: Organization for Instruction (Evaluation)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Philosophy, goals and objectives implemented														
	P	1	9	3	27	6	54	1	9	0	0	0	0	11
	DH	1	8	5	41	3	25	2	17	1	8	0	0	12
	T	3	12	6	25	8	33	5	20	0	0	2	8	24
	S	4	17	11	45	8	33	0	0	0	0	1	4	24
2. Courses available to all students														
	P	2	17	1	8	5	41	3	25	1	8	0	0	12
	DH	5	41	4	33	2	17	1	8	0	0	0	0	12
	T	4	17	4	17	8	33	5	20	3	12	0	0	24
	S	11	45	10	41	1	4	2	8	0	0	0	0	24

3. Schedules, time allotments, class sizes appropriate													
P	0	0	3	25	8	66	1	8	0	0	0	0	12
DH	4	33	2	17	4	33	1	8	1	8	0	0	12
T	2	8	6	25	6	25	7	29	3	12	0	0	24
S	4	17	9	37	9	37	1	4	1	4	0	0	24
4. Financial support adequate													
P	0	0	5	41	5	41	2	17	0	0	0	0	12
DH	1	8	3	25	5	41	3	25	0	0	0	0	12
T	2	8	3	12	11	45	6	25	2	8	0	0	24
S	3	12	4	17	8	33	7	29	2	8	0	0	24
5. Adequate cooperative planning													
P	0	0	2	17	9	75	1	8	0	0	0	0	12
DH	1	8	3	25	4	33	4	33	0	0	0	0	12
T	0	0	2	8	9	37	10	41	3	12	0	0	24
S	2	8	11	45	6	25	2	8	3	12	0	0	24
6. In-school and out-of-school resources used													
P	0	0	1	8	9	75	1	8	1	8	0	0	12
DH	1	8	3	25	6	50	2	17	0	0	0	0	12
T	2	8	3	12	5	20	11	45	3	12	0	0	24
S	4	17	5	20	5	20	7	29	2	8	1	4	24

Table 35 (continued)

Participants Ratings: Organization for Instruction (Evaluation)

Large Size Schools

7. Program information communicated to stakeholders															
	P	0	0	2	17	5	41	5	41	0	0	0	0	12	
	DH	1	8	0	0	6	50	3	25	2	17	0	0	12	
	T	3	13	6	26	8	34	6	26	0	0	0	0	23	
	S	0	0	8	33	10	41	6	25	0	0	0	0	24	

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Organization for Instruction (Evaluation)

Table 35 presents the frequencies and a percentage for each of the seven statements directed at an evaluation of organization for instruction in the industrial arts programs in 12 large size participating schools.

Principals = 12

The 12 principals rated all of the 7 statements either 5 or 4 and when these ratings and their percentages were combined they fell within the "Adequate" range which was from 25 to 74%. As a consequence, statements 4 (41%), 1 (36%), and 2 and 3 (25%) were placed in the "Adequate" Category. Statements 5 and 7 (17%) and 6 (8%) were placed in the "Low" category.

Department Heads = 12

Similar to the principals, the department heads had no statement fall within the "High" category. Statements 2 (74%), 3 (50%), 1 (49%), and 4, 5, and 6 (33%) all fell within the "Adequate" category. Statement 7(8%) fell within the 0-24% range for the "Low" category.

Teachers = 24

Similar to the department heads, the teachers placed 6 of the 7 statements in the "Adequate" category. These statements were 7 (39%), 1 (37%), 2 (34%), and 3 (33%).

Statements 4 and 6 (20%) and 5 (8%) fell within the 0-24% range for the "Low" category.

Students = 24

By their ratings of 5, excellent and 4, good the 24 students placed 1 statement in the "High" category. This was statement 2 (86%). The remaining 6 statements were placed in the "adequate" category. These criteria in rank order were: 1(62%), 3 (54%), 5 (53%), 6 (37%), 7 (33%) and 4 (29%).

Comments on Organization for Instruction

Principals

- There were eight principals who suggested that the industrial arts programs in secondary schools put too much emphasis on teaching skills only to those students who would seek employment after leaving school. To make industrial arts a more integral part of general education, the school should also try to serve the needs of those students who are not taking industrial arts programs.

- Six principals commented that the school should make a greater effort to get community partnerships involved in teaching industrial arts in secondary schools.

- Four principals reported that their schools were facing insufficient funding for materials and facilities needed to organize an efficient industrial arts program.

- Three principals reported that their schools were unable to organize an effective industrial arts program because of insufficient funding.

- Two principals of large schools stated that their students were from high income families who encouraged their children to take the college bound stream rather than the industrial arts stream.

Department Heads

- Nine department heads suggested that in order to achieve the industrial arts goals, it was necessary to increase instructional time.

- Seven department heads commented that as a result of insufficient facilities, equipment, and personnel, it was very difficult to organize the time tabling to allow all industrial arts classes to use the limited resources available.

- Six department heads recommended that the Department of General Education provide the school with the facilities and equipment the school needed rather than with the equipment the Department believes the school should have.

Teachers

- Nine teachers commented that because of insufficient instruction time for industrial arts courses in secondary schools, the current industrial arts curriculum does not provide students with sufficient skills and knowledge for future employment.

- Three teachers felt that their school administration promoted excellence in academics rather than in the industrial arts program.

- Two teachers recommended that their schools be more considerate in providing supporting budget for the industrial arts program.

- Two teachers felt that the community in which their schools were located did not considered the industrial arts program a top priority and as a result the industrial arts program did not receive a fair share of the community resources.

Students

- There were ten students who suggested that the instructional time for industrial arts courses be increased.

- Eight students advised that their schools should attempt to offer a wider variety of industrial arts courses in order to meet individual student needs and future career goals.

- Six students commented that their schools could not operate an effective industrial arts program because of insufficient facilities, materials, equipment, and supporting budget.

- Three students recommended that their schools cooperate more readily with local resource people who may be used by the schools to support the teaching of industrial arts.

- Three students suggested that their schools take them on field trips to visit technical institutions and industries in the community to allow students to gain more information about further education or future employment.

Table 36

Participants Ratings: Description of Offerings

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Based on technological concepts, processes, and systems														
	P	1	8	4	33	4	33	3	25	0	0	0	0	12
	DH	2	17	3	25	3	25	3	25	1	8	0	0	12
	T	4	17	7	29	10	41	0	0	3	12	0	0	24
	S	2	8	9	37	8	33	3	12	2	8	0	0	24
2. Knowledge technological development effect on people														
	P	3	25	4	33	4	33	0	0	1	8	0	0	12
	DH	2	17	3	25	4	33	2	17	1	8	0	0	12
	T	4	17	7	29	6	25	4	17	3	12	0	0	24
	S	5	21	6	26	11	47	1	4	0	0	0	0	23

3. Content drawn from three major areas													
P	1	8	5	41	6	50	0	0	0	0	0	0	12
DH	2	17	4	33	3	25	3	25	0	0	0	0	12
T	1	8	4	17	9	37	5	20	5	20	0	0	24
S	6	25	9	37	4	17	3	12	2	8	0	0	24
4. Developing understanding, and application of technological concepts													
P	1	8	4	33	6	50	1	8	0	0	0	0	12
DH	3	25	4	33	4	33	0	0	1	8	0	0	12
T	4	17	9	37	7	29	4	17	0	0	0	0	24
S	6	25	10	41	7	29	0	0	1	4	0	0	24
5. Apply tools, materials, processes, and concepts safely													
P	1	8	4	33	7	58	0	0	0	0	0	0	12
DH	4	33	2	17	4	33	2	17	0	0	0	0	12
T	10	41	6	25	6	25	2	8	0	0	0	0	24
S	11	4	10	41	3	12	0	0	0	0	0	0	24
6. Develop skills, creative abilities, and technological potentials													
P	3	25	2	17	7	58	0	0	0	0	0	0	12
DH	2	17	2	17	6	50	2	17	0	0	0	0	12
T	4	17	9	37	8	33	3	12	0	0	0	0	24
S	7	29	9	37	8	33	0	0	0	0	0	0	24

Table 36 (continued)

Participants Ratings: Description of Offerings

Large Size Schools

7. Develop problem-solving, decision-making ability														
	P	1	8	7	58	4	33	0	0	0	0	0	0	12
	DH	2	17	5	41	3	25	2	17	0	0	0	0	12
	T	3	12	8	33	9	37	4	17	0	0	0	0	24
	S	7	30	11	47	4	17	0	0	1	4	0	0	23
8. Prepare for lifelong learning														
	P	1	8	3	25	8	66	0	0	0	0	0	0	12
	DH	2	17	6	50	4	33	0	0	0	0	0	0	12
	T	3	12	11	45	8	33	2	8	0	0	0	0	24
	S	4	17	11	45	6	25	1	4	1	4	1	4	24
9. Activities reinforces abstract concepts with concrete experiences														
	P	5	41	6	50	1	8	0	0	0	0	0	0	12
	DH	3	25	6	50	3	25	0	0	0	0	0	0	12
	T	7	29	9	37	8	33	0	0	0	0	0	0	24
	S	1	4	18	75	4	17	0	0	1	4	0	0	24

10. Emphasis on combination of
"know-how" and "ability to do."

P	1	8	11	91	0	0	0	0	0	0	0	0	12
DH	5	41	4	33	3	25	0	0	0	0	0	0	12
T	9	37	9	37	6	25	0	0	0	0	0	0	24
S	13	54	7	29	4	17	0	0	0	0	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Description of Offerings (Evaluation)

Table 36 presents the frequencies and percentages for each of the 10 statements directed at the courses offerings in the industrial arts programs in the 12 large size schools involved in this study.

Principals = 12

The 12 principals rated two of the 10 criteria in the "High" category. These were statements 10 (99%) and 9 (91%). Statements 7 (64%), 2 (58%), 3 (49%), 6 (42%), 1, 4, and 5 (41%) and 8 (33%) were all assigned to the "Adequate" category

Department Heads = 12

The department heads rated all but one of the criteria into the "Adequate" category. Similar to the principals, the department heads placed statement 9 (75%) in the "High" category. Statements 10 (74%), 7 (68%), 8 (67%), 4 (58%), 3 and 5 (50%), 1 and 2 (42%) and 6 (34%) were all placed in the "Adequate" category by the department heads.

Teachers = 24

Unlike the principals and department heads, the teachers did not rank any of the 10 criteria in the "High" category. All were placed in the "Adequate" category. The "Adequate" statements presented in rank order are as follows: 10 (74%), 5 and 9 (66%), 8 (57%), 4 and 6 (54%),.1 and 2 (46%), 7 (45%), and 3 (25%).

Students = 24

Similar to the principals, the students placed two of the criteria in the "High" category. These were statements 10 (83%) and 9 (79%). The remaining eight criteria were placed in the "Adequate" category. These statements and their ratings in rank order are as follows: 7 (77%), 4 and 6 (66%), 3 and 8 (62%), 2 (47%), 1 and 5 (45%)..

There appeared to be relatively strong agreement between the principals, department heads, teachers and students regarding the "Description of Offerings (Evaluation)" criteria.

Table 37

Participants Ratings: Description of Offerings (Evaluation)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Information and experiences related to technology														
	P	2	17	5	41	5	41	0	0	0	0	0	0	12
	DH	3	25	3	25	6	50	0	0	0	0	0	0	12
	T	4	17	8	33	8	33	4	17	0	0	0	0	24
	S	4	17	7	29	9	37	2	8	2	8	0	0	24
2. Scope and sequence related to student's development needs														
	P	1	9	2	18	6	54	2	18	0	0	0	0	11
	DH	3	25	4	33	5	41	0	0	0	0	0	0	12
	T	3	12	11	45	5	20	5	20	0	0	0	0	24
	S	3	12	11	45	10	41	0	0	0	0	0	0	24

3. Problem-solving experiences with tools, material, technological concepts														
	P	0	0	9	75	3	25	0	0	0	0	0	0	12
	DH	3	25	6	50	3	25	0	0	0	0	0	0	12
	T	5	20	9	37	6	25	2	8	2	8	0	0	24
	S	4	17	12	50	7	29	1	4	0	0	0	0	24
4. Technological development and its effect on people/environment														
	P	1	8	1	8	9	75	1	8	0	0	0	0	12
	DH	2	17	5	41	5	41	0	0	0	0	0	0	12
	T	2	8	7	29	10	41	2	8	3	12	0	0	24
	S	2	8	12	50	7	29	3	12	0	0	0	0	24
5. Develop students' responsibility and leadership														
	P	1	8	5	41	5	41	1	8	0	0	0	0	12
	DH	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	3	12	5	20	12	50	2	8	2	8	0	0	24
	S	5	20	8	33	8	33	2	8	0	0	1	4	24
6. Program flexibility to meet needs of all students														
	P	0	0	5	41	5	41	2	17	0	0	0	0	12
	DH	4	33	3	25	4	33	1	8	0	0	0	0	12
	T	2	8	9	37	5	20	6	25	2	8	0	0	24
	S	1	4	13	56	6	26	2	8	1	4	0	0	23

Table 37 (continued)

Participants Ratings: Description of Offerings (Evaluation)

Large Size Schools

7. Students exhibit safe working habits

P	0	0	6	50	3	25	3	25	0	0	0	0	12
DH	3	25	5	41	4	33	0	0	0	0	0	0	12
T	5	20	5	20	11	45	3	12	0	0	0	0	24
S	6	25	8	33	7	29	2	8	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Description of Offerings - Evaluation

Table 37 presents the frequencies and percentages for each of the seven statements directed at an evaluation of courses offerings in the industrial arts programs in the 12 large size participating schools.

Principals = 12

The 12 principals rated all but two of the seven criteria as "Adequate." Statement 3 (75%) was rated in the "High" category and 4 (16%) in the "Low" category. The five statements rated in the "Adequate" category and their rank order are as follows: 1 (58%), 7 (50%), 5 (49%), 6 (41%), and 2 (17%).

Department Heads = 12

The department heads rated six of the 7 criteria in the "Adequate" category. Statements 5 and 7 (66%), 2, 41 and 6 (58%), and 1 (50%) were all listed as part of the "Adequate" category. The remaining statement, 3 (75%) was placed in the "High" category.

Teachers = 24

The teachers placed all seven criteria in the "Adequate" category. There ratings in rank order were: 2 and 3 (57%), 1 (50%), 6 (45%), 7 (40%), 4 (37%), and 5 (32%).

Students = 24

The students, similar to the teachers, rated all the criteria in the "Adequate" category. The items listed in rank order are as follows: 3 (67%), 6 (60%), 7 and 4 (58%), 2 (57%), 5 (53%), and 1 (46%).

Comments on Course Offerings

Principals

- Five principals recommended that the Ministry of Education provide secondary schools with facilities and equipment to enable them to offer the same kind of program as the vocational education schools at the upper secondary level. This would allow more student access to the program in secondary schools locate throughout the country.

- Three principals commented that the students in their schools needed a wider variety of industrial arts courses to suit the needs of both the industrial arts program students and the college bound program students.

- Three principals reported that some industrial arts courses offered in their schools were so popular (automotive, electricity and electronics, and metalwork) that their schools could not serve the needs of all students who wished to take them.

Department Heads

- Ten department heads recommended secondary schools be supplied with more modern facilities and equipment to enable them to offer industrial arts courses that were up-to-date with current technology.

- Seven department heads suggested that some industrial arts courses in their schools were ill equipped to meet the needs of the students and the community their schools served. The courses mentioned were ceramics, woodwork, and plastics.

- Five department heads suggested that their schools be provided with the necessary equipment and facilities to offer industrial arts courses they believed to be more suitable to their students' needs.

Teachers

- Eight teachers commented that the majority of their students left school after Grade 9. These students either furthered their education at technical institutions or sought employment. The teachers felt it was necessary for the schools to provide these students with sufficient skills and experiences for career goals.

- Seven teachers indicated that in order to improve the quality of industrial arts teaching at this level of education, it was necessary for their schools to be provided with sufficient facilities and equipment.

- Five teachers recommended that the content of current secondary school industrial arts courses be upgraded to the level of vocational education courses in terms of the skills, knowledge, and experiences required of students

Students

- Twelve students suggested that their schools be equipped to offer industrial arts courses that would sufficiently prepare students to either further their education or to find gainful employment after leaving school.

- Five students suggested that their schools make an effort to offer computer courses since it is necessary for students to be computer literate in the current computer oriented society.

- Four students reported that industrial arts courses offered in their schools did not served the needs of the majority of the students. They felt that these courses were not up-to-date with the current developments in technology.

Table 38

Participants Ratings: Components Instructional Program - Faculty

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria	Rating												
	5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Meet degree certification and competency requirements													
P	5	41	5	41	2	17	0	0	0	0	0	0	12
DH	7	58	5	41	0	0	0	0	0	0	0	0	12
T	12	50	7	29	3	12	2	8	0	0	0	0	24
S	8	33	13	54	2	8	1	4	0	0	0	0	24
2. Competent in researching, planning, directing, evaluating activities													
P	4	33	4	33	4	33	0	0	0	0	0	0	12
DH	4	33	6	50	2	17	0	0	0	0	0	0	12
T	11	45	7	29	6	25	0	0	0	0	0	0	24
S	9	37	12	50	3	12	0	0	0	0	0	0	24

3. Broad preparation and certification in four major systems

P	2	17	6	50	4	33	0	0	0	0	0	0	12
DH	4	33	3	25	4	33	1	8	0	0	0	0	12
T	5	21	3	13	3	13	4	17	4	17	4	17	23
S	5	20	7	29	8	33	2	8	2	8	0	0	24

4. Technically competent in assigned teaching area(s)

P	3	25	4	33	4	33	0	0	1	8	0	0	12
DH	4	33	4	33	3	25	1	8	0	0	0	0	12
T	10	41	8	33	3	12	3	12	0	0	0	0	24
S	6	26	12	52	5	21	0	0	0	0	0	0	23

5. Knowledge of legal requirements for laboratory operation

P	2	17	4	33	4	33	2	17	0	0	0	0	12
DH	6	50	4	33	2	17	0	0	0	0	0	0	12
T	7	29	11	45	4	17	0	0	2	8	0	0	24
S	5	20	11	45	8	33	0	0	0	0	0	0	24

6. Possesses plan to develop professional, technical competencies

P	0	0	4	33	7	58	1	8	0	0	0	0	12
DH	4	33	4	33	4	33	0	0	0	0	0	0	12
T	6	25	7	29	8	33	2	8	1	4	0	0	24
S	3	12	13	54	7	29	1	4	0	0	0	0	24

Table 38 (continued)

Participants Ratings: Components Instructional Program - Faculty

Large Size Schools

7. Cooperation plan with supporting personnel of implementation instruction														
	P	1	8	4	33	7	57	0	0	0	0	0	0	12
	DH	4	33	5	41	2	17	1	8	0	0	0	0	12
	T	3	12	8	33	8	33	3	12	2	8	0	0	24
	S	1	4	9	37	11	45	1	4	2	8	0	0	24
8. Possession of current knowledge of industrial education														
	P	1	8	4	33	5	41	0	0	2	17	0	0	12
	DH	4	33	5	41	3	25	0	0	0	0	0	0	12
	T	7	29	8	33	4	17	5	20	0	0	0	0	24
	S	4	17	9	37	8	33	2	8	1	4	0	0	24
9. Adhere to written code of ethics														
	P	2	17	4	33	6	50	0	0	0	0	0	0	12
	DH	6	50	6	50	0	0	0	0	0	0	0	0	12
	T	11	45	10	41	3	12	0	0	0	0	0	0	24
	S	9	37	11	45	4	17	0	0	0	0	0	0	24

10. Competent written, oral language skills

P	4	33	5	41	4	33	0	0	0	0	0	0	13
DH	5	41	7	58	0	0	0	0	0	0	0	0	12
T	9	37	15	62	0	0	0	0	0	0	0	0	24
S	7	29	13	54	4	17	0	0	0	0	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Components Instructional Program - Faculty

Table 38 presents the frequencies and percentages for each of the 10 statements directed at the industrial arts faculty in the 12 large size schools involved in this study.

Principals = 12

There were 10 criteria in this section. The principals rated nine of them as "Adequate." The principals' "Adequate" rating was as follows: 10 (74%), 3 (67%), 2 (66%), 4 (58%), 5 and 9 (50%), 7 and 8 (41%) and 6 (33%). Statement 1 (82%) was rated as "High."

Department Heads = 12

The department heads split the ten criteria evenly between the "High" and "Adequate" categories. Criteria 9 (100%), 1 and 10 (99%), and 2 and 5 (83%) were all placed in the "High" category. Statements 7 and 8 (74%), 4 and 6 (66%), and 3 (58%) comprised the "Adequate" category.

Teachers = 24

The teachers placed three criteria in the "High" category. Their ratings of these criteria in rank order were as follows: 10 (99%), 9 (86%), and 1 (79%). Statements 2, 4, and 5 (74%), 8 (62%), 6 (54%), 7 (45%), and 3 (34%) were placed in the "Adequate" category.

Students = 24

The students split the ten criteria equally between the "High" and "Adequate" categories. Statements 1 and 2 (87%), 10 (83%), 9 (82%), and 4 (78%) were placed in the "High" category while 6 (66%), 5 (65%), 8 (54%), 3 (49%) and 7 (41%) were placed in the "Adequate" category.

The department heads, teachers and students seem to rank these criteria generally higher than the principals.

Table 39

Participants Ratings: Components Instructional Program - Faculty (Evaluation)

Large sized Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate preparation to teach subjects														
	P	3	25	4	33	5	41	0	0	0	0	0	0	12
	DH	4	33	5	41	3	25	0	0	0	0	0	0	12
	T	4	17	12	50	4	17	4	17	0	0	0	0	24
	S	3	12	16	66	4	17	1	4	0	0	0	0	24
2. Informed of current educational development														
	P	2	17	4	33	6	50	0	0	0	0	0	0	12
	DH	2	17	0	0	6	50	2	17	2	17	0	0	12
	T	0	0	7	29	6	25	11	45	0	0	0	0	24
	S	1	4	12	50	7	29	2	8	2	8	0	0	24

3. Commitment to professional growth													
	P	2	17	3	25	7	57	0	0	0	0	0	0	12
	DH	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	5	20	9	37	8	33	2	8	0	0	0	0	24
	S	6	25	11	45	5	20	1	4	1	4	0	0	24
4. Well-defined industrial point of view toward specialization														
	P	2	17	4	33	6	50	0	0	0	0	0	0	12
	DH	4	33	5	41	3	25	0	0	0	0	0	0	12
	T	5	20	10	41	5	20	4	17	0	0	0	0	24
	S	6	25	12	50	6	25	0	0	0	0	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Components Instructional Program - Faculty (Evaluation)

Table 39 presents the frequencies and percentages for each of the four statements directed at evaluation of industrial arts faculty in the 12 large size participating schools.

Principals = 12

There were four criteria in this section. The principals rated them all as "Adequate." The principals' rating was as follows: 1 (58%), 2 and 4 (50%),and 3 (42%).

Department Heads = 12

The department heads rated 2 (17%) as belonging to the "Low" category. Statements 1 and 4 (74%), and 3 (66%) were included as part of the "Adequate" category.

Teachers = 24

The teachers placed all five criteria in the "Adequate" category. There ratings of the criteria in rank order were as follows: 1 (67%), 4 (61%), 3 (57%) and 2 (29%).

Students = 24

The students split the four criteria between the "High" and "Adequate" categories. Statements 1 (78%) and 4 (75%) were placed in the "High" category while 3 (70%) and 2 (54%) were placed in the "Adequate" category.

Although statement 2 was ranked relatively low on everyone's list, only the department heads placed it in the "Low" category.

Comments on Faculty

Principals

- Ten principals commented that there was not sufficient in-service training for industrial arts teachers to keep abreast of the new skills and knowledge corresponding to current technology.

- Seven principals commented that their industrial arts staff often left teaching to work for private industry for financial reasons. These principals reported that it was difficult to find well-qualified industrial arts teachers to replace those who departed in the middle of a school year.

- Nine principals commented that their schools had to use technicians or skilled tradesmen with no teacher education background to teach industrial arts courses because of the shortage of well-qualified industrial arts teachers.

- Nine principals felt that their industrial arts teachers often lacked the personal relations skills needed to cooperatively work with other school personnel.

- Eight principals recommended that their industrial arts staff should have the opportunity to regularly attend in-service training and seminars to help them do their jobs more efficiently.

Department Heads

- Eight department heads recommended that industrial arts teachers needed to attend in-service training on: equipment maintenance, shop house keeping, record keeping, inventory maintenance, student achievement evaluation, and safety practices.

- Seven department heads suggested that their industrial arts staff should devote more time and effort to teaching.

- Five department heads suggested that their industrial arts staff be recognized by the school administrative committee for their achievement as evident by student success.

Teachers

- Fifteen industrial arts teachers reported that they had never attended a seminar or in-service during their teaching careers and thus had not improved their professional competencies since graduation.

- Twelve industrial arts teachers suggested that there was a need for an equipment maintenance center to provide schools with maintenance service.

- Seven industrial arts teachers recommended that the Ministry of Education set up a center for industrial arts teachers in the country to regularly meet and exchange professional information.

Students

- Twelve industrial arts students believed that their industrial arts teachers were very competent in their teaching. However these students felt that they needed more individual assistance from their teachers.

- Six industrial arts students commented that some industrial arts teachers lacked experience in some of the teaching areas of industrial arts.

- Three industrial arts students felt that their teachers did not always prepare sufficiently for demonstrations and lectures.

- Two students commented that their teachers did not recognize individual differences and assigned the same project to all students in a given class.

Table 40

Participants Ratings: Components of the Instructional Program - Instructional Activities

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1 Teacher planning consistent with program goals, objectives														
	P	4	33	6	50	2	17	0	0	0	0	0	0	12
	DH	2	17	7	58	3	25	0	0	0	0	0	0	12
	T	8	33	9	37	7	29	0	0	0	0	0	0	24
	S	4	17	15	62	5	20	0	0	0	0	0	0	24
2. Lesson plans based on course of study, and student needs														
	P	1	8	6	50	5	41	0	0	0	0	0	0	12
	DH	3	25	4	33	5	41	0	0	0	0	0	0	12
	T	7	29	10	41	7	29	0	0	0	0	0	0	24
	S	4	17	15	62	5	20	0	0	0	0	0	0	24

3. Teacher develop/obtain appropriate,
up-to-date instructional materials

P	0	0	2	17	6	50	4	33	0	0	0	0	12
DH	2	17	4	33	5	41	1	8	0	0	0	0	12
T	4	17	6	25	12	50	2	8	0	0	0	0	24
S	2	8	9	37	8	33	2	8	3	12	0	0	24

4. Plan/provide for evaluation
of instruction

P	2	17	3	25	7	58	0	0	0	0	0	0	12
DH	5	41	5	41	2	17	0	0	0	0	0	0	12
T	7	29	10	41	5	20	2	8	0	0	0	0	24
S	5	21	14	61	4	17	0	0	0	0	0	0	23

5. Alternative methods used to assist
students to meet course objectives

P	1	8	3	25	6	50	2	17	0	0	0	0	12
DH	3	25	5	41	4	33	0	0	0	0	0	0	12
T	10	41	7	29	5	20	2	8	0	0	0	0	24
S	8	33	10	41	5	20	1	4	0	0	0	0	24

6. Activities develop understanding
of technology

P	1	8	4	33	7	58	0	0	0	0	0	0	12
DH	4	33	4	33	4	33	0	0	0	0	0	0	12
T	2	8	8	33	8	33	6	25	0	0	0	0	24
S	2	8	11	45	7	29	4	17	0	0	0	0	24

Table 40 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Large Size Schools

7. Improve student ability to make career choices														
	P	2	17	5	41	7	58	0	0	0	0	0	0	14
	DH	5	41	4	33	2	17	0	0	1	8	0	0	12
	T	8	33	9	37	2	8	5	20	0	0	0	0	24
	S	7	29	12	50	3	12	1	4	1	4	0	0	24
8. Equips students with transferable skills for further preparation														
	P	0	0	4	33	6	50	2	17	0	0	0	0	12
	DH	5	41	4	33	2	17	0	0	1	8	0	0	12
	T	5	20	7	29	5	20	6	25	1	4	0	0	24
	S	2	8	12	50	6	25	1	4	3	12	0	0	24
9. Emphasis on lifelong learning in technological society														
	P	2	17	3	25	7	58	0	0	0	0	0	0	12
	DH	3	25	6	50	2	17	0	0	1	8	0	0	12
	T	9	37	4	17	6	25	5	20	0	0	0	0	24
	S	3	12	9	37	8	33	4	17	0	0	0	0	24

10. Develop skills, positive self-concepts, individual potentials in technology													
P	0	0	5	41	7	58	0	0	0	0	0	0	12
DH	5	41	4	33	3	25	0	0	0	0	0	0	12
T	6	25	9	37	5	20	4	17	0	0	0	0	24
S	6	25	11	45	5	20	2	8	0	0	0	0	24
11. Application of tools, materials, machines, processes, technical concepts taught													
P	4	33	4	33	4	33	0	0	0	0	0	0	12
DH	4	33	5	41	2	17	1	8	0	0	0	0	12
T	7	29	10	41	4	17	3	12	0	0	0	0	24
S	10	41	6	25	8	33	0	0	0	0	0	0	24
12. Creative, critical thinking, decision making, problem solving skills taught													
P	3	25	2	17	7	58	0	0	0	0	0	0	12
DH	4	33	5	41	3	25	0	0	0	0	0	0	12
T	9	37	7	29	5	20	3	12	0	0	0	0	24
S	8	33	9	37	7	29	0	0	0	0	0	0	24
13. Teacher-centered and student-centered instructional methods used													
P	3	25	3	25	4	33	2	17	0	0	0	0	12
DH	4	33	4	33	4	33	0	0	0	0	0	0	12
T	7	29	10	41	4	17	3	12	0	0	0	0	24
S	3	12	12	50	7	29	1	4	1	4	0	0	24

Table 40 (continued)

Participants Ratings: Components of the Instructional Program - Instructional Activities

Large Size Schools

14. Multi-disciplinary learning opportunities provided														
	P	1	8	3	25	7	58	1	8	0	0	0	0	12
	DH	4	33	4	33	3	25	0	0	1	8	0	0	12
	T	0	0	8	33	8	33	6	25	0	0	2	8	24
	S	4	17	6	50	8	33	1	4	5	20	0	0	24
15. Group and individual learning activities used														
	P	3	25	4	33	4	33	1	8	0	0	0	0	12
	DH	5	41	3	25	3	25	1	8	0	0	0	0	12
	T	7	29	6	25	9	37	2	8	0	0	0	0	24
	S	5	20	10	41	7	29	2	8	0	0	0	0	24
16. Student leadership skills developed through curricular, co-curricular activities														
	P	0	0	4	33	6	50	2	17	0	0	0	0	12
	DH	3	25	5	41	4	33	0	0	0	0	0	0	12
	T	5	20	9	37	7	29	2	8	1	4	0	0	24
	S	1	4	9	37	11	45	3	12	0	0	0	0	24

17. Community resources supplement instruction												
	P	0	0	0	0	9	75	2	17	1	8	0	0	12
	DH	2	17	3	25	5	41	1	8	1	8	0	0	12
	T	0	0	8	33	7	29	2	8	7	29	0	0	24
	S	2	8	11	45	6	25	4	17	1	4	0	0	24
18. Students use in-school and out-of-school resources to fulfill assignments														
	P	0	0	2	17	7	58	3	25	0	0	0	0	12
	DH	2	17	4	33	4	33	1	8	1	8	0	0	12
	T	3	12	4	17	7	29	7	29	3	12	0	0	24
	S	2	9	9	39	5	21	4	17	2	9	1	4	23

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program

- Instructional Activities

Table 40 presents the frequencies and a percentage for each of the 18 statements directed at the industrial arts instructional activities in the 12 large size schools involved in this study.

Principals = 12

There were 18 criteria in this section. The principals rated all but two of them as "Adequate." Criterion 1 (83%) was rated as "High" while criterion 17 (0%) was rated "Low." The remaining 16 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 11 (66%), 2, 7, and 15 (58%), 13 (50%), 4, 9, 12, and 17 (42%), 6 and 10 (41%), and 5, 8, 14, and 16 (33%).

Department Heads = 12

The department heads rated criteria 4 (82%), 9 and 1 (75%) as "High." The remaining 15 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 7, 8, 10, 11, and 12 (74%), 5,6,13, 14, 15, 16 (66%), 2 (58%), 3 (50%), and 17 (42%).

Teachers = 24

Unlike the principals, department heads and students, the teachers did not rank any of the 18 criteria as "High."

Criteria 19 (8%) was ranked as "Low." The remaining 17 criteria were ranked as "Adequate." Their ratings in rank order are as follows: 1, 2, 4, 5, 7, 11, 13 (70%), 12 (66%), 10 (62%), 16 (57%), 9 and 15 (54%),8 (49%), 3 (42%), 6 (41%), and 14 (33%).

Students = 24

The students ranked criteria 4 (82%), and 1, 2, and 7 (79%) in the "High" category. They included the remaining 14 criteria as part of the "Adequate" category. The statements included in the "Adequate" category in rank order were as follows: 5 (74%), 10 and 12 (70%), 14 (67%), 11 (66%), 13 (62%), 8 (58%), 6 and 17 (53%), 9 (49%), 3 (45%), and 15 and 16 (41%).

Only the teachers did not include at least one of the criteria in the "High" category. Both the department heads and students made more liberal use of the "High" category than did the principals.

Table 41

Participants Ratings: Components of the Instructional Program - Instructional Activities (Evaluation)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional activities effectively related to students' needs, goals														
	P	1	8	4	33	7	58	0	0	0	0	0	0	12
	DH	3	25	6	50	2	17	1	8	0	0	0	0	12
	T	2	8	11	45	6	25	3	12	2	8	0	0	24
	S	5	20	11	45	7	29	1	4	0	0	0	0	24
2. Adequate planning, preparation for instructional program														
	P	0	0	3	25	5	41	4	33	0	0	0	0	12
	DH	2	17	6	50	4	33	0	0	0	0	0	0	12
	T	2	8	12	50	4	17	6	25	0	0	0	0	24
	S	2	8	10	41	12	50	0	0	0	0	0	0	24

3. Community resources effectively incorporated into instructional program

P	0	0	2	17	6	50	4	33	1	8	0	0	12
DH	2	17	3	25	4	33	3	25	0	0	0	0	12
T	2	8	4	17	9	37	7	29	2	8	0	0	24
S	2	8	7	29	7	29	5	20	2	8	1	4	24

4. Teachers effectively work with academic teachers

P	1	8	3	25	6	50	2	17	0	0	0	0	12
DH	4	33	3	25	3	25	1	8	1	8	0	0	12
T	3	13	6	26	4	17	3	13	5	21	2	9	23
S	3	12	7	29	8	33	3	12	3	12	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program

- Instructional Activities (Evaluation)

Table 41 presents the frequencies and a percentage for each of the four statements directed at the evaluation of the industrial arts instructional activities in the 12 large size schools involved in this study.

Principals = 12

There were 4 criteria in this section. The principals rated all but one of them as "Adequate." Criterion 3 (17%) was rated as "Low." The remaining 3 criteria were rated as "Adequate." The "Adequate" ratings in rank order were as follows: 1 (41%),4 (33%), 2 (25%).

Department Heads = 12

The department heads rated criterion 1 (75%) as "High." The remaining 3 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 2 (67%), 4 (58%), and 3 (42%).

Teachers = 24

Unlike the principals and department heads, the teachers did not rank any of the 4 criteria as "High" or "Low." All four criteria were ranked as "Adequate." Their ratings in rank order were as follows: 2 (58%), 1 (53%), 4 (39%) and 3 (25%).

Students = 24

The students, similar to the teachers, ranked all four of the criteria as "Adequate." The statements included in the "Adequate" category in rank order were as follows: 1 (65%), 2 (49%), 4 (41%), and 3 (37%).

Comments on Instructional Activities

Principals

- Six principals suggested that their schools tried to offer instructional activities that would enable students to make money during the school year.

- Four principals reported that their schools made an effort to offer instructional activities in areas that the labor market needed.

- Three principals commented that their schools had not yet used community partnerships for resources, equipment or resource people.

- Three principals reported that their schools used industrial arts instructional activities to improve attitudes of parents toward industrial arts.

- Two principals needed a safety expert to help set up a safety program in their schools' industrial arts shops.

Department Heads

- Eight department heads recommended that a study tour for students to factories in the nearby community be used to supplement industrial arts instructional activities.

- Seven department heads suggested that due to insufficient facilities and equipment, industrial arts students should be sent to train at vocational centers or private enterprises in the nearby communities.

- Five department heads reported that their schools informed the community and parents of industrial arts goals in order to get the community's support in organizing instructional activities.

Teachers

- Ten teachers reported that their schools lacked technical textbooks and teacher guides to use in organizing effective instructional activities.

- Eight teachers suggested that community resources be used to support industrial arts activities.

- Seven teachers recommended that their schools be provided with sufficient and up to date industrial arts facilities and equipment in order to offer effective instructional activities.

- Five teachers recommended that the Department of General Education provide schools with more technical textbooks and teaching aids.

Students

- Thirteen industrial arts students reported that their school shops did not have sufficient space for instructional activities.

- Ten industrial arts students reported that class sizes of industrial arts courses were too large. As a result, students had to wait for long periods of time before having a chance to use tools and equipment.

- Six industrial arts students reported that the equipment in their school shops was not in good enough condition to offer effective instructional activities; thus, it is necessary to replace this equipment with up-to-date equipment that corresponds to current technology.

Table 42

Participants Ratings: Components of the Instructional Program - Material and Media

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Wide range reading materials available														
	P	0	0	3	25	6	50	3	25	0	0	0	0	12
	DH	2	17	0	0	5	41	4	33	1	8	0	0	12
	T	1	4	2	8	6	25	6	25	7	29	1	4	24
	S	1	4	7	29	12	50	2	8	2	8	0	0	24
2. Material provided for different student's ability levels														
	P	0	0	3	25	6	50	3	25	0	0	0	0	12
	DH	2	17	2	17	4	33	3	25	1	8	0	0	12
	T	0	0	4	17	4	17	9	37	7	29	0	0	24
	S	0	0	7	29	12	50	5	20	0	0	0	0	24

3. Variety of instructional equipment available and used														
	P	0	0	2	17	6	50	4	33	0	0	0	0	12
	DH	2	17	5	41	2	17	3	25	0	0	0	0	12
	T	0	0	6	25	10	41	6	25	2	8	0	0	24
	S	1	4	6	25	11	45	4	17	2	8	0	0	24
4. Resource units, study guides, support materials used														
	P	0	0	2	17	5	41	5	41	0	0	0	0	12
	DH	2	17	0	0	6	50	2	17	2	17	0	0	12
	T	0	0	4	17	6	25	7	29	7	29	0	0	24
	S	3	12	7	29	6	25	5	20	3	12	0	0	24
5. Adequate instructional materials to meet program goals														
	P	0	0	1	8	7	58	3	25	1	8	0	0	12
	DH	2	17	0	0	5	41	3	25	2	17	0	0	12
	T	0	0	4	17	5	20	10	41	5	20	0	0	24
	S	2	8	6	25	13	54	3	12	0	0	0	0	24
6. Instructional materials provided for occupational experiences stimulation														
	P	0	0	2	17	6	50	4	33	0	0	0	0	12
	DH	2	17	5	41	4	33	1	8	0	0	0	0	12
	T	3	12	10	41	8	33	3	12	0	0	0	0	24
	S	5	20	13	54	5	20	1	4	0	0	0	0	24

Table 42 (c0ntinued)

Participants Ratings: Components of the Instructional Program - Material and Media

Large Size Schools

7. Copyright law observed in reproducing and using copyrighted materials													
P	1	8	2	17	5	41	0	0	2	17	2	17	12
DH	2	17	5	41	2	17	0	0	0	0	3	25	12
T	3	13	9	39	6	26	3	13	1	4	1	4	23
S	7	29	10	41	3	12	0	0	3	12	1	4	24
8. Guidelines established for selecting instructional materials													
P	0	0	0	0	3	25	2	17	7	58	0	0	12
DH	2	17	6	50	2	17	1	8	1	8	0	0	12
T	3	12	8	33	3	12	6	25	4	12	0	0	24
S	4	33	8	33	10	41	0	0	2	8	0	0	24
9. Faculty participate in selecting new instructional materials													
P	0	0	0	0	6	50	2	17	4	33	0	0	12
DH	2	17	5	41	4	3	1	8	0	0	0	0	12
T	3	12	10	41	6	25	5	20	0	0	0	0	24
S	3	12	12	50	8	33	1	4	0	0	0	0	24

10. Media faculty members participate in selecting new materials														
	P	0	0	0	0	7	58	2	17	3	25	0	0	12
	DH	2	17	5	41	3	25	1	8	1	8	0	0	12
	T	2	8	5	20	6	25	7	29	4	17	0	0	24
	S	2	8	8	33	10	41	3	12	1	4	0	0	24
11. Current professional publications accessible to teachers %														
	P	2	17	2	17	4	33	0	0	4	25	0	0	12
	DH	1	8	3	25	3	25	4	33	1	8	0	0	12
	T	3	12	3	12	5	20	5	20	8	33	0	0	24
	S	1	4	14	61	2	9	5	21	1	4	0	0	23
12. Audio-visual materials readily available for teacher use														
	P	0	0	1	8	4	33	4	33	3	25	0	0	12
	DH	1	8	3	25	3	25	4	33	1	8	0	0	12
	T	3	25	8	66	1	8	0	0	0	0	0	0	12
	S	3	12	18	75	2	8	0	0	1	4	0	0	24
13. Teachers and students use a variety instructional materials														
	P	0	0	2	17	6	50	0	0	4	33	0	0	12
	DH	5	41	4	33	2	17	1	8	0	0	0	0	12
	T	2	8	10	41	7	29	3	12	2	8	0	0	24
	S	6	25	10	41	8	33	0	0	0	0	0	0	24

Table 42

Participants Ratings: Components of the Instructional Program - Material and Media

Large Size Schools

14. Career exploration and development materials available														
	P	0	0	1	8	4	33	1	8	6	50	0	0	12
	DH	3	25	2	17	2	17	4	33	1	8	0	0	12
	T	0	0	6	25	5	20	6	25	6	25	1	4	24
	S	0	0	13	54	8	33	3	12	0	0	0	0	24
15. Suitable methods used for materials ordering, keeping inventory, material/media														
	P	1	8	3	25	6	50	0	0	2	17	0	0	12
	DH	2	17	6	50	4	33	0	0	0	0	0	0	12
	T	5	20	6	25	8	33	3	12	2	8	0	0	24
	S	3	12	12	50	6	50	3	12	0	0	0	0	24
16. Annual budget available for consumable supplies/resource materials														
	P	0	0	1	8	4	33	4	33	2	17	0	0	11
	DH	2	17	4	33	4	33	2	17	0	0	0	0	12
	T	2	8	7	29	7	29	6	25	2	8	0	0	24
	S	2	8	9	37	7	29	3	12	3	12	0	0	24

17. Adequate storage provision for
materials and media

P	0	0	0	0	2	17	3	25	7	58	0	0	12
DH	2	17	3	25	4	33	3	25	0	0	0	0	12
T	2	8	5	20	6	25	5	20	5	20	1	4	24
S	7	29	6	25	9	37	1	4	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program
- Material and Media

Table 42 presents the frequencies and percentages for each of the 17 statements directed at the industrial arts materials and media in the 12 large size schools involved in this study.

Principals = 12

There were 17 criteria in this section. The principals rated all but five of them as "Low." Criterion 11 (34%), 15 (33%), and 2, 7 and 1 (25%) were rated as "Adequate." The 13 criteria rated as "Low" and presented in rank order are as follows: 3, 4, 6, and 13 (17%), 5, 12, 14, and 16 (8%), and 8,9, 10, and 17 (0%)

Department Heads = 12

The department heads only rated criteria, 1, 5, and 4 (17%) as "Low." The remaining 13 criteria were rated as "Adequate." The criteria included in the "Adequate" rating were as follows: 13 (74%), 8 and 15 (67%), 3, 6, 7, 9, and 10 (58%), 16 (50%), 14 and 17 (42%), 2 (34%), and 11 and 12 (33%).

Teachers = 24

Unlike the principals and department heads, the teachers used all three categories. Criteria 12 (91%) was deemed

"High." Criteria 9 and 6 (53%), 7 (52%), 13 (49%), 8 and 15 (45%), 16 (37%), 17 and 10 (28%) and 3 and 14 (25%) were all placed in the "Adequate" category. The five criteria placed in the "low category were as follows: 11 (24%), 2, 4, and 5 (17%), and 1 (12%).

Students = 24

The students placed all but one of the criteria in the "Adequate" category. Statement 12 (87%) was placed in the "High" category. The 16 criteria included in the "Adequate" category in rank order were as follows: 6 (74%), 9 (72%), 7 (70%), 8 and 13 (66%), 11 (65%), 15 (62%), 14 and 17 (54%), 16 (45%), 4 and 10 (41%), 1 and 5 (33%) and 2 and 3 (29%).

The department heads, teachers and students were relatively close in their ranking of the 17 criteria included in "Components of the Instructional Program - Material and Media." The principals were much less positive in their responses placing 12 of these criteria in the "Low" category.

Table 43

Participants Ratings: Components of the Instructional Program - Materials and Media (Evaluation)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Adequate scope of instructional materials and media														
	P	0	0	0	0	2	17	3	25	7	58	0	0	12
	DH	2	17	2	17	6	50	0	0	2	17	0	0	12
	T	0	0	2	9	11	47	7	30	3	13	0	0	23
	S	1	4	6	25	11	45	5	20	1	4	0	0	24
2. Adequate quality of instructional materials and media														
	P	0	0	0	0	2	17	4	33	6	50	0	0	12
	DH	2	17	3	25	5	41	0	0	2	17	0	0	12
	T	0	0	4	17	10	41	8	33	2	8	0	0	24
	S	1	4	9	37	8	33	4	17	2	8	0	0	24

3. Adequate quantity of instructional materials and media

P	0	0	0	0	4	33	3	25	5	41	0	0	12
DH	2	17	2	17	4	33	3	25	1	8	0	0	12
T	0	0	4	17	11	47	6	26	2	9	0	0	23
S	2	8	5	20	8	33	6	25	3	12	0	0	24

4. Instructional materials accessible to students, teachers

P	0	0	4	33	6	50	2	17	0	0	0	0	12
DH	2	17	4	33	4	33	2	17	0	0	0	0	12
T	1	4	7	29	7	29	8	33	1	4	0	0	24
S	2	8	8	33	6	25	5	20	3	12	0	0	24

5. Instructional materials well-organized, maintained

P	0	0	0	0	6	50	2	17	4	33	0	0	12
DH	2	17	4	33	6	50	0	0	0	0	0	0	12
T	2	9	9	39	9	39	3	13	0	0	0	0	23
S	1	4	13	54	8	33	1	4	1	4	0	0	24

6. Instructional materials used by faculty and students

P	0	0	7	58	3	25	2	17	0	0	0	0	12
DH	4	33	4	33	4	33	0	0	0	0	0	0	12
T	6	25	10	41	6	25	2	8	0	0	0	0	24
S	6	26	11	47	6	26	0	0	0	0	0	0	23

Table 43 (continued)

Participants Ratings: Components of the Instructional Program - Materials and Media (Evaluation)

Large Size Schools

7. Provision for storage of instructional materials

P	0	0	1	8	3	25	4	33	4	33	0	0	12
DH	2	17	3	25	5	41	0	0	2	17	0	0	12
T	3	12	6	25	4	17	6	25	5	20	0	0	24
S	4	17	5	20	8	33	6	25	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Students

Components of the Instructional Program
- Material and Media (Evaluation)

Table 43 presents the frequencies and percentages for each of the seven statements directed at the evaluation of the industrial arts materials and media in the 12 large size schools involved in this study.

Principals = 12

There were 7 criteria in this section. The principals rated all but two of them as "Low." Criteria 6 (58%) and 4 (33%) were rated as "Adequate." The 5 criteria rated as "Low" and presented in rank order are as follows: 7 (8%), 1, 2, 3, and 5 (0%).

Department Heads = 12

The department heads rated all seven criteria as "Adequate." Their ratings in rank order were as follows: 6 (66%), 4 and 5 (50%), 2 and 7 (42%), and 1 and 3 (34%)

Teachers = 24

The teachers, similar to the principals, spread their ratings of these criteria over two categories. Statements 6 (66%), 5 (48%), 7 (37%), and 4 (33%) were placed in the "Adequate" category by the teachers. Statements 2 and 3 (17%) and 1 (9%) were placed in the "Low" category.

Students = 24

The students, similar to the department heads, placed all the criteria in the "Adequate" category. Statement 12 (87%) was placed in the "High" category. The seven criteria included in the "Adequate" category in rank order were as follows: 6 (73%), 5 (58%), 2 (43%), 4 (41%), 7 (37%) 1 (29%), and 3 (28%).

The department heads' ratings were close to those of the students while the ratings of the principals were close to those of the teachers.

Comments on Materials and Media

Principals

- Ten principals commented that their schools' industrial arts shops were equipped with inferior quality equipment and facilities. They recommended that their schools be equipped with an acceptable quality of equipment and facilities.

- Five principals indicated the major constraints their schools faced in offering effective industrial arts programs included: insufficient equipment, tools, and materials to meet the demands of students who wished to take industrial arts courses.

- Four principals commented that their schools were short of consumable materials for the industrial arts program. To solve this problem, the schools tried to get community support for materials and equipment.

- Four principals reported that their schools lacked materials, equipment and well-qualified industrial arts teachers and therefore, only a few industrial arts courses were offered.

Department Heads

- Eight department heads commented that their school shops were equipped with sub-standard equipment and an insufficient quantity of equipment to serve the needs of the students who wished to take industrial arts courses.
- Seven department heads reported that their schools used community partnerships to secure materials, equipment and resource people to support the teaching of industrial arts in their schools.
- Five department heads reported trying to cope with insufficient budgets for industrial arts programs by charging a small student fee for materials and occasionally selling student projects to the public.

Teachers

- Six industrial arts teachers reported that insufficient amounts of equipment resulted in industrial arts classes that were too large.
- Due to insufficient funding, five industrial arts teachers reported that their schools used recycled materials in their shops.

- Three industrial arts teachers suggested that the Department of General Education provide schools with visiting maintenance personnel to help maintain equipment and facilities.

- Three industrial arts teachers suggested that a team of technicians regularly visit their schools to help facility and equipment problems.

Students

- Ten students reported that their school shops lacked necessary tools, equipment, and materials for the industrial arts program.

- Five students indicated that the facilities and equipment available in their school shops were not up-to-date with current technology.

- Three students recommended that their school provide lockers for industrial arts students to keep materials and personal belongings.

- Two students commented that some equipment and machines were obsolete and no longer operable.

Table 44

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Student assessment is an integral part of instruction														
	P	3	25	4	33	5	41	0	0	0	0	0	0	12
	DH	4	33	5	41	2	17	1	8	0	0	0	0	12
	T	9	39	10	43	4	17	0	0	0	0	0	0	23
	S	6	25	15	62	3	12	0	0	0	0	0	0	24
2. Student assessment provided for individual differences														
	P	3	25	6	50	2	17	1	8	0	0	0	0	12
	DH	2	17	5	41	3	25	2	17	0	0	0	0	12
	T	6	25	7	29	7	29	2	8	2	8	0	0	24
	S	2	8	10	41	6	25	4	17	2	8	0	0	24

3. Results of students assessment reported to students, teachers, parents

P	2	17	5	41	4	33	1	8	0	0	0	0	12
DH	2	17	5	41	3	25	2	17	0	0	0	0	12
T	6	25	9	37	5	20	3	12	1	4	0	0	24
S	4	17	10	41	2	8	4	17	3	12	1	4	24

4. Student assessment results used for:

a. - diagnosing students' learning styles, knowledge/skills levels

P	5	41	3	25	4	33	0	0	0	0	0	0	12
DH	2	17	3	25	4	33	2	17	1	8	0	0	12
T	6	27	7	31	4	18	2	9	3	13	0	0	22
S	2	8	11	45	9	37	0	0	2	8	0	0	24

b. - determining students' achievement levels

P	3	25	4	33	5	41	0	0	0	0	0	0	12
DH	2	17	6	50	4	33	0	0	0	0	0	0	12
T	5	20	13	54	4	17	2	8	0	0	0	0	24
S	4	17	12	50	5	20	1	4	2	8	0	0	24

c. - assessing students' strengths and weaknesses

P	2	17	5	41	5	41	0	0	0	0	0	0	12
DH	2	17	4	33	5	41	0	0	1	8	0	0	12
T	5	20	10	41	7	29	2	8	0	0	0	0	24
S	4	17	12	50	3	12	2	8	3	12	0	0	24

Table 44 (continued)

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Large Size Schools

d. - determining students' abilities in problem solving													
P	2	17	5	41	4	33	1	8	0	0	0	0	12
DH	1	8	4	33	3	25	4	33	0	0	0	0	12
T	5	20	11	45	8	33	0	0	0	0	0	0	24
S	1	4	15	62	6	25	1	4	1	4	0	0	24
e. - counseling students													
P	1	8	3	25	6	50	2	17	0	0	0	0	12
DH	3	25	5	41	2	17	2	17	0	0	0	0	12
T	6	25	8	33	7	29	3	12	0	0	0	0	24
S	2	8	13	54	7	29	1	4	1	4	0	0	24
5. Continuous program evaluation used to determine program goals													
P	1	8	7	58	3	25	1	8	0	0	0	0	12
DH	2	17	6	50	4	33	0	0	0	0	0	0	12
T	5	21	8	34	10	43	0	0	0	0	0	0	23
S	2	9	10	43	9	39	2	9	0	0	0	0	23

6. Variety of measurement formats used
to meet students' characteristics, courses objectives

P	0	0	4	33	5	41	0	0	3	25	0	0	12
DH	2	17	6	50	4	33	0	0	0	0	0	0	12
T	0	0	9	27	9	37	6	25	0	0	0	0	24
S	0	0	14	61	5	21	1	4	3	13	0	0	23

7. Program outcomes and student performance
measured on appropriate data

P	0	0	5	41	6	50	0	0	1	8	0	0	12
DH	2	17	3	25	7	58	0	0	0	0	0	0	12
T	3	12	7	29	7	29	2	8	3	12	0	0	22
S	0	0	13	54	7	29	3	12	1	4	0	0	24

8. Program evaluation results used to determine
teacher, program effectiveness

P	1	8	6	50	4	33	1	8	0	0	0	0	12
DH	2	17	4	33	4	33	1	8	1	8	0	0	12
T	2	9	5	21	8	34	4	17	3	13	1	4	23
S	2	8	11	45	6	25	3	12	2	8	0	0	24

Table 44 (continued)

Participants Ratings: Components of the Instructional Program - Student Assessment and Program Evaluation

Large Size Schools

9. Program evaluation results used for making program changes													
P	2	17	5	41	4	33	1	8	0	0	0	0	12
DH	2	17	4	33	0	0	5	41	1	8	0	0	12
T	2	8	4	17	6	25	8	33	4	17	0	0	24
S	1	4	13	54	6	25	3	12	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program
- Student Assessment and Program Evaluation

Table 44 presents the frequencies and percentages for each of the 13 statements directed at components of the industrial arts instructional program (student assessment and program evaluation) in the 12 large size schools involved in this study.

Principals = 12

There were 9 criteria in this section and criterion 4 was subdivided into five parts.. The principals rated all but one of the nine criteria as "Adequate"." Criteria 2 (75%) was rated as "High." The remaining criteria rated as "Adequate" and presented in rank order are as follows: 4a and 5 (66%), 1, 3, 4b, 4c, 4d (58%), 7 (41%) and 4e and 6 (33%).

Department Heads = 12

The department heads rated all the criteria as "Adequate." Their ratings in rank order were as follows: 1 (74%), 4b, 4e, 5, and 6 (67%), 2 and 3 (58%), 4c, 8, and 9 (50%), 4a and 7 (42%), and 4d (41%).

Teachers = 24

The teachers, similar to the principals, rated all but one of the criteria as "Adequate." Statement 1 (87%) was placed in the "High" category. Statements 4b (74%), 4d (65%), 3 (62%), 4c (61%), 4a and 4e (58%), 5 (55%), 2 (54%), 7 (41%), 8 (30%), 6 (27%) and 9 (25%) were placed in the "Adequate" category.

Students = 24

The students, similar to the principals and teachers, placed all but one of the criteria in the "Adequate" category. Statement 1 (87%) was placed in the "High" category. The remaining criteria included in the "Adequate" category in rank order were as follows: 4b and 4c (67%), 4d (66%), 4e (62%), 6 (61%), 3 and 9 (58%), 7 (54%), 4a and 8 (53%), 5 (52%), and 2 (49%).

None of these criteria were placed in the "Low" category by any of the groups.

Comments on Student Assessment & Program Evaluation

Principals

- Six principals commented that there should be evaluative criteria available for industrial arts teachers to use as guidelines for evaluating student achievement in industrial arts courses.

- Eight principals suggested that industrial arts students be evaluated on their attitudes, skills, safety practices, and processes used in making their projects rather than just the finished projects.

- Five principals suggested that their industrial arts teachers needed in-service training on how to evaluate industrial arts student achievement.

Department Heads

- Ten department heads commented that their industrial arts staff lacked the necessary knowledge and techniques for evaluating industrial arts student achievement.
- Six department heads reported that their industrial arts staff had not fully used the evaluation results of student achievement to improve their instructional activities.
- Four department heads reported that their industrial arts staff still emphasized paper-tests rather than practical tests for their industrial arts students.

Teachers

- Six industrial arts teachers commented that more attention should be given to skills and experiences acquired by industrial arts students rather than on the material products produced by the students.
- Six industrial arts teachers commented that parents still valued material products produced by their children more than student educational growth in knowledge, skills, and experience.
- Four industrial arts teachers suggested that in addition to skills and knowledge, house keeping habits and

safety practices in school shops should be evaluated as a part of student achievement in industrial arts courses.

Students

- Ten industrial arts students suggested that the instructional time for industrial arts courses be increased to allow sufficient time for them to acquire the necessary skills and experiences to get some kind of employment after leaving school.
- Six industrial arts students suggested that there should be acceptable evaluative criteria used to evaluate industrial arts subjects.
- Four students commented that their teachers did not provided for individual difference in student assessment in industrial arts subjects.
- Three students recommended that evaluation of student achievement in industrial arts be more objective so that there would be no bias in the marking of their projects.

Table 45

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria	Rating												
	5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Instructional areas close to related instructional areas													
P	4	33	5	41	2	17	1	8	0	0	0	0	12
DH	5	41	4	33	3	25	0	0	0	0	0	0	12
T	9	37	11	45	0	0	4	17	0	0	0	0	24
S	10	43	10	43	3	13	0	0	0	0	0	0	23
2. Appropriate spaces provision for variety instructional activities													
P	2	17	4	33	2	17	4	33	0	0	0	0	12
DH	3	25	4	33	4	33	1	8	0	0	0	0	12
T	6	25	5	20	8	33	1	4	4	17	0	0	24
S	2	9	9	39	8	34	3	13	1	4	0	0	23

3. Laboratory floor meets acceptable standards for instructional activities

P	2	17	4	33	4	33	2	17	0	0	0	0	12
DH	4	33	4	33	2	17	2	17	0	0	0	0	12
T	4	17	11	45	4	17	0	0	5	20	0	0	24
S	4	17	9	39	6	26	3	13	1	4	0	0	23

4. Adequate lavatory facilities for both sexes provided in close proximity

P	1	8	3	25	4	33	3	25	1	8	0	0	12
DH	1	8	2	17	3	25	3	25	3	25	0	0	12
T	2	8	5	20	5	20	6	25	6	25	0	0	24
S	4	17	7	30	5	21	5	21	0	0	2	9	23

5. Adequate office space for each teacher

P	1	8	2	17	5	41	4	33	0	0	0	0	12
DH	2	17	2	17	3	25	3	25	2	17	0	0	12
T	3	12	5	20	10	41	0	0	6	25	0	0	24
S	2	8	9	37	9	37	2	8	1	4	1	4	24

6. Adequate demonstration and discussion area provided

P	1	8	4	33	5	41	2	17	0	0	0	0	12
DH	3	25	2	17	3	25	2	17	2	17	0	0	12
T	4	17	7	29	7	29	3	12	3	12	0	0	24
S	2	9	10	43	8	34	2	9	0	0	1	4	23

Table 45 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Large Size Schools

7. Ceiling height appropriate for activities being conducted													
P	1	8	7	58	2	17	2	17	0	0	0	0	12
DH	3	25	2	17	3	25	2	17	2	17	0	0	12
T	5	20	10	41	5	20	2	8	2	8	0	0	24
S	5	21	11	47	6	26	0	0	0	0	1	4	23
8. Instructional areas have provision for adequate heat, light, ventilation, acoustics control													
P	0	0	3	25	6	50	3	25	0	0	0	0	12
DH	2	17	3	25	4	33	3	25	0	0	0	0	12
T	0	0	6	50	9	37	5	20	4	17	0	0	24
S	2	8	4	17	9	37	5	20	2	8	1	4	24
9. Proper exhaust equipment provided													
P	0	0	0	0	3	25	3	25	5	41	1	8	12
DH	1	8	0	0	1	8	2	17	5	41	3	25	12
T	0	0	3	12	0	0	4	17	11	45	6	25	24
S	0	0	1	4	2	8	4	17	12	50	5	20	24

10. Appropriate utilities provided in instructional areas

P	0	0	0	0	4	33	5	41	3	25	0	0	12
DH	2	17	0	0	3	25	5	41	2	17	0	0	12
T	3	12	2	8	3	12	7	29	6	25	3	12	24
S	1	4	3	12	5	20	9	37	5	20	1	4	24

11. The instructional areas meet all safety regulations

P	0	0	4	33	4	33	4	33	0	0	0	0	12
DH	3	25	3	25	3	25	3	25	0	0	0	0	12
T	2	8	7	29	9	37	3	12	3	12	0	0	24
S	2	9	10	43	8	34	1	4	1	4	1	4	23

12. Safety barriers, zones, and aisles are properly marked

P	0	0	0	0	4	33	6	50	2	17	0	0	12
DH	3	25	2	17	2	17	2	17	2	17	1	8	12
T	0	0	5	20	5	20	5	20	6	25	3	12	24
S	0	0	6	25	5	20	2	8	8	33	3	12	24

13. Instructional area floors kept free of waste materials, grease, obstructions

P	0	0	3	25	6	50	3	25	0	0	0	0	12
DH	2	17	3	25	3	25	2	17	2	17	0	0	12
T	3	13	8	34	8	34	2	9	2	9	0	0	23
S	3	12	4	17	12	50	3	12	0	0	2	8	24

Table 45 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Large Size Schools

14. Non-skid surface floors on machine-operated work areas														
	P	0	0	1	8	6	50	5	41	0	0	0	0	12
	DH	2	17	3	25	3	25	2	17	0	0	2	17	12
	T	0	0	10	41	4	17	2	8	3	12	5	20	24
	S	2	8	3	12	10	41	3	12	4	17	2	8	24
15. Emergency disconnect switch for equipment easily accessible														
	P	1	8	0	0	7	58	1	8	3	25	0	0	12
	DH	3	25	2	17	3	25	2	17	2	17	0	0	12
	T	6	26	7	30	3	13	0	0	4	17	3	13	23
	S	8	33	5	20	6	25	2	8	2	8	1	4	24
16. Fire extinguishers of correct class provided in appropriate locations														
	P	0	0	1	8	6	50	3	25	2	17	0	0	12
	DH	2	17	4	33	2	17	0	0	4	33	0	0	12
	T	6	26	2	9	3	13	5	21	4	17	3	13	23
	S	3	12	8	33	3	12	2	8	7	9	1	4	24

17. A first-aid kit, related emergency supplies provided according to regulations

P	0	0	0	0	5	41	2	17	5	41	0	0	12
DH	2	17	0	0	4	33	2	17	3	25	1	8	12
T	0	0	3	12	4	17	6	25	7	29	4	17	24
S	0	0	2	8	3	12	2	8	16	66	1	4	24

18. Color-coding schemes for safety purposes used throughout the laboratory

P	0	0	1	8	4	33	4	33	3	25	0	0	12
DH	2	17	3	25	4	33	0	0	2	17	1	8	12
T	0	0	2	9	7	30	3	13	4	17	7	30	23
S	1	4	5	20	8	33	4	17	4	17	2	8	24

19. Lockable master switch boxes located in each laboratory

P	1	8	4	33	3	25	3	25	1	8	0	0	12
DH	4	33	4	33	2	17	0	0	2	17	0	0	12
T	6	25	8	33	3	12	3	12	2	8	2	8	24
S	1	4	11	47	5	21	2	9	3	13	1	4	23

20. Adequate, safe, secure storage for supplies, equipment provided

P	1	8	4	33	3	25	4	33	0	0	0	0	12
DH	2	17	3	25	3	25	2	17	2	17	0	0	12
T	2	8	7	29	5	20	3	12	7	29	0	0	24
S	1	4	9	37	7	29	4	17	2	8	1	4	24

Table 45 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Facilities)

Large Size Schools

21. Adequate storage for individual and group projects														
	P	0	0	0	0	4	33	4	33	3	25	1	8	12
	DH	2	17	3	25	3	25	0	0	3	25	1	8	12
	T	0	0	2	8	4	17	6	25	7	29	4	17	23
	S	0	0	5	20	6	25	1	4	9	37	3	12	24
22. Sufficient size display cases, properly located provision														
	P	0	0	1	8	2	17	4	33	5	41	0	0	12
	DH	2	17	0	0	4	33	3	25	3	25	0	0	12
	T	0	0	0	0	3	12	8	33	8	33	5	20	24
	S	0	0	2	8	5	20	8	33	8	33	1	4	24
23. Appropriate storage lockers are provided for students														
	P	0	0	0	0	2	17	2	17	7	58	1	8	12
	DH	2	17	0	0	2	17	2	17	3	25	3	25	12
	T	0	0	0	0	2	8	6	25	10	41	5	20	23
	S	0	0	1	4	3	12	3	12	15	62	1	4	23

24. Radioactive, flammable, corrosive materials are safely stored													
P	0	0	0	0	2	17	5	41	5	41	0	0	12
DH	2	17	2	17	2	17	2	17	3	25	1	8	12
T	0	0	2	8	5	20	5	20	8	33	4	17	24
S	0	0	3	12	8	33	3	12	9	37	1	4	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program
- Facilities and Equipment (Facilities)

Table 45 presents the frequencies and percentages for each of the 24 statements directed at facilities and equipment (facilities) of the industrial arts programs in the 12 large size participating schools.

Principals = 12

There were 24 criteria in this section. The principals divided the criteria equally between the "Adequate" and "Low" categories. The 12 statements included in the "Adequate" category in rank order were as follows: 1 (74%), 7 (66%), 2 and 3 (50%), 20, 6, and 19 (41%), 11 and 4 (33%), and 5, 8 and 13 (25%). Statements 14, 15, 16, 18 22 (8%) and 9, 10, 12, 17, 21, 23 and 24 (0%) made up the "Low" category.

Department Heads = 12

The department heads rated 19 of the 24 criteria as "Adequate." Their ratings in rank order were as follows: 1 (74%), 3 and 19 (66%), 2 (58%), 11 and 16 (50%), 6, 7, 8, 12, 13, 14, 15, 18, 20, and 21 (42%), 5 and 24 (34%), and 4 (25%). The department heads placed statements 10, 17, 22, and 23 (17%), and 9 (8%) in the "Low" category.

Teachers = 24

The teachers rated one of the criteria as "High." This was statement 1 (82%). Statements 3 (62%), 7 (61%), 19 (58%), 15 (56%), 8 (50%), 13 (47%), 6 (46%), 2 (45%), 14 (41%), 11 and 20 (37%), 16 (35%), 5 (32%), and 4 (28%) were all placed in the "Adequate" category. The following criteria were placed in the "Low" category: 10 and 12 (20%), 9 and 17 (12%), 18 (9%), 21 and 24 (8%), and 22 and 23 (0%).

Students = 24

The students, identical to the teachers, placed all but one of the criteria in the "Adequate" category. Statement 1 (87%) was placed in the "High" category. The remaining criteria included in the "Adequate" category in rank order were as follows: 4b and 4c (67%), 4d (66%), 4e (62%), 6 (61%), 3 and 9 (58%), 7 (54%), 4a and 8 (53%), 5 (52%), and 2 (49%).

None of these criteria were placed in the "Low" category by any of the groups.

Table 46

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Large Sized Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Variety of equipment and supplies available														
	P	0	0	4	33	4	33	4	33	0	0	0	0	12
	DH	1	8	4	33	3	25	4	33	0	0	0	0	12
	T	2	8	7	29	7	29	8	33	0	0	0	0	24
	S	1	4	7	29	10	41	3	12	3	12	0	0	24
2. Appropriate audiovisual equipment available														
	P	0	0	2	17	5	41	5	41	0	0	0	0	12
	DH	1	8	0	0	4	25	4	33	3	25	0	0	12
	T	0	0	0	0	12	50	10	41	2	8	0	0	24
	S	1	4	5	20	11	45	6	25	1	4	0	0	24

3. Adequate chalkboards, bulletin boards provision

P	0	0	5	41	5	41	2	17	0	0	0	0	12
DH	1	8	4	33	3	25	2	17	2	17	0	0	12
T	2	8	5	20	8	33	6	25	3	12	0	0	24
S	2	8	6	25	10	41	4	17	1	4	1	4	24

4. Adequate supplies, equipment available for instruction

P	0	0	2	17	7	58	3	25	0	0	0	0	12
DH	1	8	0	0	4	33	5	41	2	17	0	0	12
T	2	8	2	8	8	33	9	37	3	12	0	0	24
S	2	8	4	17	8	33	9	37	1	4	0	0	24

5. Well-maintained equipment, meeting safety requirements

P	0	0	4	33	5	41	3	25	0	0	0	0	12
DH	1	8	1	8	6	50	2	17	2	17	0	0	12
T	4	17	6	25	11	45	3	12	0	0	0	0	24
S	0	0	9	37	10	41	2	8	3	12	0	0	24

6. Safety guards remain in place, except when the equipment is under repair

P	0	0	2	17	8	66	2	17	0	0	0	0	12
DH	1	8	3	25	5	41	3	25	0	0	0	0	12
T	3	12	7	29	7	29	7	29	0	0	0	0	24
S	2	8	8	33	8	33	2	8	3	12	1	4	24

Table 46 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Large Sized Schools

7. All machine tools are provided with safety guards

P	0	0	3	25	5	41	4	33	0	0	0	0	12
DH	1	8	1	8	6	50	2	17	2	17	0	0	12
T	3	12	4	17	9	37	6	25	2	8	0	0	24
S	1	4	8	33	9	37	3	12	2	8	1	4	24

8. Unsafe instrument being removed from service, visibly marked

P	0	0	3	25	6	50	3	25	0	0	0	0	12
DH	1	8	6	50	3	25	2	17	0	0	0	0	12
T	7	29	8	33	2	8	5	20	2	8	0	0	24
S	4	17	8	33	8	33	2	8	1	4	1	4	24

9. Magnetic control switches, braking devices provision for appropriate machines

P	0	0	2	16	7	5	0	0	3	25	0	0	12
DH	1	8	4	33	5	41	0	0	2	17	0	0	12
T	3	12	6	25	9	37	3	12	3	12	0	0	24
S	1	4	8	33	8	33	1	4	5	20	1	4	24

10. Eye protection devices provided for persons exposed to eye injury conditions

P	0	0	4	33	6	50	1	8	1	8	0	0	12
DH	1	8	3	25	5	41	0	0	3	25	0	0	12
T	2	8	8	33	8	33	2	8	3	12	1	4	24
S	3	12	9	37	5	20	1	4	5	20	1	4	24

11. Ear protection provided for persons exposed to ear damage conditions

P	0	0	0	0	6	50	2	17	4	33	0	0	12
DH	1	8	0	0	3	25	4	33	4	33	0	0	12
T	0	0	2	8	5	20	5	20	5	20	5	20	24
S	0	0	3	12	3	12	1	4	16	66	1	4	24

12. Respiratory protection devices provision

P	0	0	1	8	4	33	3	25	4	33	0	0	12
DH	1	8	1	8	2	17	4	33	4	33	0	0	12
T	0	0	2	8	3	12	8	33	7	29	4	12	24
S	0	0	3	12	4	17	1	4	15	62	1	4	24

13. Head protection devices provision

P	0	0	0	0	5	41	3	25	4	3	0	0	12
DH	2	17	0	0	0	0	6	50	4	33	0	0	12
T	2	8	4	17	3	12	6	25	6	25	3	12	24
S	0	0	3	12	4	17	1	4	15	62	1	4	24

Table 46 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment (Supplies and Equipment)

Large Sized Schools

14. Appropriate clothing worn by teachers and students when exposed to conditions warrant

P	0	0	2	17	3	25	4	33	2	17	1	8	12
DH	1	8	2	17	0	0	5	41	4	33	0	0	12
T	3	12	2	8	6	25	4	17	7	29	2	8	24
S	0	0	4	17	4	17	5	20	9	37	2	8	24

15. Personal protection devices sanitized after each use

P	0	0	3	25	4	33	5	41	0	0	0	0	12
DH	1	8	2	17	4	33	2	17	3	25	0	0	12
T	2	9	5	21	6	26	4	17	4	17	2	9	23
S	0	0	7	29	7	29	3	12	6	25	1	4	24

16. Corrective, preventive maintenance performed within reasonable time

P	0	0	4	33	6	50	2	17	0	0	0	0	12
DH	1	8	2	17	6	50	3	25	0	0	0	0	12
T	2	8	8	33	8	33	0	0	6	25	0	0	24
S	1	4	10	41	7	29	3	12	1	4	2	8	24

17. Appropriate furniture for instruction provision													
P	0	0	3	25	7	58	1	8	1	8	0	0	12
DH	1	8	2	17	6	50	3	25	0	0	0	0	12
T	0	0	6	26	9	39	4	17	4	17	0	0	23
S	2	8	6	25	11	45	3	12	2	8	0	0	24
18. Machines placed, mounted in safe, functional manner													
P	0	0	3	25	7	58	1	8	1	8	0	0	12
DH	1	8	2	7	5	41	2	17	2	17	0	0	12
T	3	12	9	37	6	25	6	25	0	0	0	0	24
S	4	17	9	37	9	37	1	4	1	4	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Components of the Instructional Program

- Facilities and Equipment (Supplies and Equipment)

Table 46 presents the frequencies and percentages for each of the 18 statements directed at supplies and equipment for the industrial arts programs in the 12 large size participating schools.

Principals = 12

There were 18 criteria in this section. The principals divided the criteria between the "Adequate" and "Low" categories. The 10 statements included in the "Adequate" category in rank order were as follows: 3 (41%), 1, 5, 10, and 16 (33%), and 7, 8, 15, 17 and 18 (25%). Statements 2, 4, 6, and 14 (17%), 9 (16%), 12 (8%), and 11 and 13 (0%) made up the "Low" category.

Department Heads = 12

The department heads rated 9 of the 18 criteria as "Adequate." Their ratings in rank order were as follows: 8 (58%), 1, 3, and 9 (41%), 10 (33%), 14, 15, 16, and 17 (25%). The department heads placed statements 6 (23%), 13 (17%), 5, 7, and 12 (16%), 18 (15%), 4, 2, and 11 (8%) in the "Low" category.

Teachers = 24

The teachers rated statements 8 (62%), 16 (49%), 5 (42%), 6 and 10 (41%), 1 and 9 (37%), 16 (31%), 15 (30%), 7 (29%), 3 (28%), 17 (26%) and 13 (25%) in the "Adequate" category. The following criteria were placed in the "Low" category: 14 (20%), 4 (16%), 11 and 12 (8%),and 2 (0%).

Students = 24

The students placed statements 18 (54%), 8 (50%), 10 (49%), 16 (45%), 6 (41%), 5, 7, and 9 (37%) 1 and 3 (33%), 17 (31%) and 15 (29%) in the "Adequate" category. The "Low" category included 2 (24%), 4 (23%), 14 (17%), 11, 12, and 13 (12%).

Because of the large number of criteria ranked in the "Low" category by all three groups it would appear that there are a number of concerns among all the stakeholders concerning supplies and equipment.

Table 47

Participants Ratings: Components of the Instructional Program - Facilities and Equipment - Supplies and Equipment (Evaluation)

Large Size Schools

N = P 12
DH 12
T 24
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Facilities, equipment conducive to objectives achievement														
	P	0	0	4	33	6	50	2	17	0	0	0	0	12
	DH	3	25	4	33	5	41	0	0	0	0	0	0	12
	T	7	29	7	29	8	33	2	8	0	0	0	0	24
	S	2	8	8	33	13	54	1	4	0	0	0	0	24
2. Adequate instructional space provided														
	P	0	0	3	25	5	41	3	25	1	8	0	0	12
	DH	2	17	1	8	5	41	4	33	0	0	0	0	12
	T	3	13	5	21	12	52	3	13	0	0	0	0	23
	S	1	4	7	30	6	26	7	30	3	13	0	0	24

3. Adequate instructional equipment, facilities provided											
P	0	0	1	8	8	66	2	17	1	8	0	0	12
DH	1	8	3	25	3	25	5	41	0	0	0	0	12
T	0	0	2	8	10	41	6	25	6	25	0	0	24
S	1	4	6	25	7	29	7	29	3	12	0	0	24
4. Facilities, equipment effectively used for instructional activities											
P	0	0	5	41	5	41	2	17	0	0	0	0	12
DH	1	8	5	41	4	33	2	17	0	0	0	0	12
T	2	8	7	29	10	41	5	20	0	0	0	0	24
S	2	9	7	30	10	43	3	13	1	4	0	0	23
5. Adequate storage facilities for supplies, equipment											
P	0	0	3	25	4	33	5	41	0	0	0	0	12
DH	1	8	2	17	3	25	3	25	3	25	0	0	12
T	0	0	7	29	8	33	7	29	2	8	0	0	24
S	3	13	7	30	5	21	7	30	1	4	0	0	23
6. Equipment well-maintained for efficient use											
P	0	0	4	33	7	58	1	8	0	0	0	0	12
DH	1	8	1	8	6	50	2	17	2	17	0	0	12
T	3	12	6	25	7	29	8	33	0	0	0	0	24
S	1	4	6	25	13	54	2	8	2	8	0	0	24

Table 47 (continued)

Participants Ratings: Components of the Instructional Program - Facilities and Equipment - Supplies and Equipment (Evaluation)

Large Size Schools

7. Laboratories adequately maintained

P	0	0	2	17	9	75	1	8	0	0	0	0	12
DH	1	8	5	41	4	33	2	17	0	0	0	0	12
T	3	13	11	47	7	30	2	9	0	0	0	0	23
S	1	4	6	25	11	45	3	12	3	12	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal
DH = Department Head
T = Industrial Arts Teachers
S = Industrial Arts Student

Components of the Instructional Program - Facilities and Equipment - Supplies and Equipment (Evaluation)

Table 47 presents the frequencies and percentages for each of the seven statements directed at the evaluation of facilities and equipment for the industrial arts programs in the 12 large size participating schools.

Principals = 12

There were 7 criteria in this section. The principals divided the criteria between the "Adequate" and "Low" categories. The 5 statements included in the "Adequate" category in rank order were as follows: 4 (41%), 5 (35%), 1 and 6 (33%), and 2 (25%). Statements 7 (17%) and 3 (8%) were placed in the "Low" category.

Department Heads = 12

The department heads rated 6 of the 7 criteria as "Adequate." Their "Adequate" ratings in rank order were as follows: 1 (58%), 4 and 7 (49%), 6 (37%), 3 (33%), 2 and 5 (25%). The department heads placed statement 6 (16%) in the "Low" category.

Teachers = 24

The teachers rated statements 7 (60%), 1 (58%), 2 (44%), 4 (37%), and 5 and 6 (29%) in the "Adequate" category. Statement 3 (8%) was placed in the "Low" category.

Students = 24

The students placed all the statements in the "Adequate" category. These statements listed in rank order were as follows: 5 (43%), 1 (41%), 4 (39%), 2 (34%), 3, 6, and 7 (29%).

There were no criteria rated in the "High" category by any of the stakeholders.

Comments on Facilities & Equipment

Principals

- Twelve principals commented that the industrial arts programs in their schools were facing budget shortages.

- Eight principals suggested that the Ministry of Education attempt to provide secondary schools with acceptable standards of industrial arts shops nationwide.

- Five principals commented that the industrial arts shops in their schools were equipped with equipment that had been used for over 20 years. Most of this equipment was obsolete and not in a good working condition and needed to be replaced.

- Three principals stated that the industrial arts facilities available did not correspond to current technology advances in society.

- Three principals stressed that the industrial arts facilities and equipment available in their schools were not only insufficient but of poor quality.

Department Heads

- Ten department heads commented that some machine tools in their industrial arts shops were not functioning because of missing parts and that parts for these machines were not readily available.

- Six department heads commented that some of their industrial arts staff did not maintain equipment properly.

- Four department heads reported that their industrial arts staff still lacked equipment maintenance knowledge and techniques. These participants recommended that a maintenance team regularly visit their schools to provide equipment maintenance service.

Teachers

- Five industrial arts teachers commented that industrial arts facilities and equipment were sub-standard and not up-to-date with current technological development.

- Five industrial arts teachers commented that the Department of General Education had provided secondary schools nationwide with the same equipment and as a result some equipment had not been used. These participants suggested that the Department of General Education conduct a needs assessment before providing equipment to schools.

- Four industrial arts teachers commented that some of their machine tools had not been used for a lengthy time because these machines needed to fixed by a maintenance technician.

Student

- Ten students commented that their industrial arts shops still lacked working space, tools, equipment, materials, first aids kits, and storage rooms.

- Nine students commented that they needed lockers to keep materials, personal belongings and unfinished individual projects.

- Three students recommended that their schools provide adequate personal protection devices for all industrial arts students.

Table 48

Participants Ratings: Learning Climate

Large Size Schools

N = P 12
DH 12
T 24
S 24

Descriptive Criteria		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Objectives reflect a clear sense of purpose														
	P	1	8	5	41	6	50	0	0	0	0	0	0	12
	DH	2	17	5	41	4	33	1	8	0	0	0	0	12
	T	3	13	7	30	10	43	3	13	0	0	0	0	23
	S	1	4	14	58	8	33	1	4	0	0	0	0	24
2. Competent, dedicated faculty														
	P	1	8	5	41	5	41	1	8	0	0	0	0	12
	DH	2	17	8	66	2	17	0	0	0	0	0	0	12
	T	5	21	8	34	10	43	0	0	0	0	0	0	23
	S	6	25	11	45	6	25	1	4	0	0	0	0	24

3. School administration provides adequate resources, encouragement

P	2	17	5	41	5	41	0	0	0	0	0	0	12
DH	2	17	8	66	1	8	1	8	0	0	0	0	12
T	0	0	7	29	8	33	7	29	2	8	0	0	24
S	0	0	6	25	12	50	3	12	3	12	0	0	24

4. High student achievement expected by administration and staff

P	2	17	7	58	3	25	0	0	0	0	0	0	12
DH	4	33	6	50	2	17	0	0	0	0	0	0	12
T	6	25	5	20	10	41	3	12	0	0	0	0	24
S	4	17	13	54	4	17	2	8	1	4	0	0	24

5. Parents, community support exists for program

P	0	0	3	25	5	41	3	25	1	8	0	0	12
DH	2	17	3	25	4	33	2	17	1	8	0	0	12
T	0	0	3	12	7	29	7	29	7	29	0	0	24
S	2	8	11	45	8	33	3	12	0	0	0	0	24

6. Instructional program based on appropriate diagnosis of students' developmental characteristics

P	0	0	3	25	8	41	1	8	0	0	0	0	12
DH	1	8	7	58	4	33	0	0	0	0	0	0	12
T	2	8	10	41	7	29	5	20	0	0	0	0	24
S	1	4	10	41	9	37	4	17	0	0	0	0	24

Table 48 (continued)

Participants Ratings: Learning Climate

Large Size Schools

7. Student placement predicated on faculty advisement, individual student plans														
	P	1	8	4	33	5	41	1	8	1	8	0	0	12
	DH	1	8	5	41	5	41	1	8	0	0	0	0	12
	T	2	9	10	43	4	17	5	21	2	9	0	0	23
	S	1	4	12	50	8	33	0	0	3	12	0	0	24
8. Classroom organization provides for optimum use of instructional time														
	P	0	0	5	41	7	58	0	0	0	0	0	0	12
	DH	1	8	6	50	3	25	2	17	0	0	0	0	12
	T	3	12	7	29	8	33	6	25	0	0	0	0	24
	S	0	0	14	58	5	20	3	12	2	8	0	0	24
9. Instructional methods facilitate individual student performance														
	P	2	17	2	17	6	50	1	8	1	8	0	0	12
	DH	2	17	6	50	4	33	0	0	0	0	0	0	12
	T	2	9	9	39	9	39	3	13	0	0	0	0	23
	S	4	17	7	29	9	37	1	4	1	4	2	8	24

10. All students are given opportunity to achieve required program and individual goals

P	0	0	5	41	7	58	0	0	0	0	0	0	12
DH	2	17	6	50	4	33	0	0	0	0	0	0	12
T	3	13	8	34	10	43	2	9	0	0	0	0	23
S	2	8	10	41	11	45	0	0	1	4	0	0	24

11. Frequent feedback on students' performance provided

P	0	0	8	66	4	33	0	0	0	0	0	0	12
DH	2	17	8	66	0	0	2	17	0	0	0	0	12
T	6	25	9	37	7	29	2	8	0	0	0	0	24
S	4	17	11	45	6	25	2	8	1	4	0	0	24

12. Appraisal of teacher performance oriented toward instructional improvement

P	1	8	5	41	6	50	0	0	0	0	0	0	12
DH	2	17	6	50	2	17	2	17	0	0	0	0	12
T	7	30	9	39	5	21	2	9	0	0	0	0	23
S	1	4	11	45	10	41	1	4	1	4	0	0	24

13. Students' self-esteem enchanted by positive relationships among peers, teachers

P	0	0	7	58	5	41	0	0	0	0	0	0	12
DH	3	25	7	58	2	17	0	0	0	0	0	0	12
T	6	25	10	41	6	25	2	8	0	0	0	0	24
S	5	20	16	66	3	12	0	0	0	0	0	0	24

Table 48 (continued)

Participants Ratings: Learning Climate

Large Size Schools

14. School classroom disciplinary standards promote positive learning environment

P	1	8	4	33	7	58	0	0	0	0	0	0	12
DH	3	25	9	75	0	0	0	0	0	0	0	0	12
T	3	14	12	54	7	31	0	0	0	0	0	0	22
S	4	17	10	41	7	29	2	8	1	4	0	0	24

15. Students, teachers are recognized for achieving program objectives

P	0	0	4	33	7	58	1	8	0	0	0	0	12
DH	4	33	6	50	2	17	0	0	0	0	0	0	12
T	2	8	12	50	2	8	6	25	2	8	0	0	24
S	5	20	8	33	9	37	1	4	0	0	1	4	24

16. Facilities pleasing, functional, safe and properly maintained													
	P	0	0	1	8	10	83	1	8	0	0	0	0	12
	DH	1	8	5	41	4	33	2	17	0	0	0	0	12
	T	3	12	5	20	8	33	5	20	3	12	0	0	24
	S	1	4	7	29	9	37	5	20	2	8	0	0	24

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Learning Climate

Table 48 presents the frequencies and percentages for each of the 16 statements directed at learning climate in the industrial arts programs in the 12 large size participating schools.

Principals = 12

There were 16 criteria in this section. The principals rated all but two of the criteria as "Adequate." Statement 16 (8%) was placed in the "Low" category and 4 (75%) was placed in the "High" category. The 14 statements included in the "Adequate" category in rank order were as follows: 11 (66%), 3 and 13 (58%), 1, 2, and 12 (49%), 7, 8, 10, and 14 (41%), 9 (34%), 15 (33%), 5 and 6 (25%).

Department Heads = 12

The department heads rated 7 of the 16 criteria as "High." Their "High" ratings in rank order were as follows: 14 (100%), 2, 3, 4, 11, 13, 14, and 15 (83%). The department heads placed statements 6, 9, 10 and 12 (67%), 1 and 8 (58%), 7 and 16 (49%), and 5 (42%) in the "Adequate" category.

Teachers = 24

The teachers rated statements 7 (60%), 1 (58%), 2 (44%), 4 (37%), and 5 and 6 (29%) in the "Adequate" category. Statement 3 (8%) was placed in the "Low" category.

Students = 24

The students placed all the statements in the "Adequate" category. These statements listed in rank order were as follows: 5 (43%), 1 (41%), 4 (39%), 2 (34%), 3, 6, and 7 (29%).

Table 49

Participants Ratings: Learning Climate (Evaluation)

Large Size Schools

N = P 12
DH 12
T 12
S 24

Evaluation Statement		Rating												
		5	%	4	%	3	%	2	%	1	%	N	%	Total
1. Learning climate support attainment of program objectives														
	P	0	0	4	33	8	66	0	0	0	0	0	0	12
	DH	2	17	7	58	3	25	0	0	0	0	0	0	12
	T	5	20	7	29	10	41	2	8	0	0	0	0	24
	S	1	4	11	45	10	41	2	8	0	0	0	0	24
2. Learning climate foster individual student satisfaction, self-esteem														
	P	0	0	4	33	6	50	2	17	0	0	0	0	12
	DH	4	33	5	41	3	25	0	0	0	0	0	0	12
	T	2	9	12	52	6	26	3	13	0	0	0	0	23
	S	1	4	12	50	10	41	1	4	0	0	0	0	24

3. Learning climate foster individual student achievement

P	0	0	5	41	6	50	1	8	0	0	0	0	12
DH	2	17	5	41	5	41	0	0	0	0	0	0	12
T	3	13	9	39	11	47	0	0	0	0	0	0	23
S	2	8	9	37	10	41	3	12	0	0	0	0	24

4. Program evaluated, revised regularly to meet content and student need

P	0	0	4	33	4	33	3	25	1	8	0	0	12
DH	3	25	5	41	4	33	0	0	0	0	0	0	12
T	0	0	8	34	11	47	2	9	2	9	0	0	23
S	0	0	11	45	11	45	1	4	1	4	0	0	24

5. To what degree do the following groups have a positive perception of learning climate:

a.- students

P	0	0	2	28	5	71	0	0	0	0	0	0	7
DH	2	20	6	60	0	0	0	0	2	20	0	0	10
T	6	25	4	17	5	20	4	17	0	0	0	0	19
S	3	15	8	40	7	35	2	10	0	0	0	0	20

b.- teachers

P	0	0	6	50	6	50	0	0	0	0	0	0	12
DH	2	17	6	50	4	33	0	0	0	0	0	0	12
T	6	26	5	21	10	43	2	9	0	0	0	0	23
S	3	12	13	54	7	29	0	0	1	4	0	0	24

Table 49 (continued)

Participants Ratings: Learning Climate (Evaluation)

Large Size Schools

c.- parents and community													
P	0	0	7	58	4	33	0	0	1	8	0	0	12
DH	1	8	6	50	2	17	3	25	0	0	0	0	12
T	2	8	9	37	6	25	5	20	2	8	0	0	24
S	2	8	9	37	8	33	1	4	1	4	0	0	21
d.- school administration													
P	0	0	5	41	6	50	1	8	0	0	0	0	12
DH	2	17	4	33	5	41	0	0	1	8	0	0	12
T	3	12	4	17	6	25	5	20	6	25	0	0	24
S	3	14	6	28	8	38	2	9	1	5	1	5	21
e.- district administration													
P	1	8	4	33	6	50	0	0	1	8	0	0	12
DH	1	8	3	25	5	41	2	17	1	8	0	0	12
T	3	13	2	9	4	17	7	31	7	31	0	0	23
S	3	14	8	38	7	37	1	5	1	5	1	5	21

f.- the Ministry of Education

P	0	0	6	50	4	33	1	8	1	8	0	0	12
DH	1	8	4	33	4	33	2	17	1	8	0	0	12
T	4	17	8	33	2	8	3	12	4	17	3	12	24
S	2	9	6	28	6	28	2	9	2	9	1	4	19

Percentage total may be less than or greater than 100 because of rounding

P = Principal

DH = Department Head

T = Industrial Arts Teachers

S = Industrial Arts Students

Learning Climate (Evaluation)

Table 49 presents the frequencies and percentages for each of the 10 statements directed at the evaluation of learning climate in the industrial arts programs in the 12 large size participating schools.

Principals = 12

There were five criteria in this section and one, item 5 had five subheadings. The principals rated all of the criteria as "Adequate." The statements included in the "Adequate" category in rank order were as follows: 5c (58%), 5b and 5f (50%), 3, 5d and 5e (41%), 1, 2, and 3 (33%), and 5a (28%).

Department Heads = 12

The department heads rated 2 of the 5 criteria as "High." Their "High" ratings in rank order were as follows: 5a (80%) and 1 (75%). The department heads placed statements 2 (74%), 5b (67%), 3 and 5c (58%), 5d (50%), 5f (41%) and 5e (33%) in the "Adequate" category.

Teachers = 24

The teachers rated statements 2 (61%), 3 (52%), 5f (50%), 1 (49%), 5b (47%), 5c (45%), 5a (42%), 4 (34%), and 5d (29%0 in the "Adequate" category. Statement 5e (22%) was placed in the "Low" category.

Students = 24

The students similar to the principals, placed all the statements in the "Adequate" category. These statements listed in rank order were as follows: 5b (66%), 5a (55%), 2 (54%), 1 and 5e (50%), 3, 4, and 5c (45%), 5d (42%), and 5f (37%).

Comments on Learning Climate

Principals

- Seven principals commented that the learning climate of the industrial arts program in their schools could be improved with the provision of sufficient facilities and a well-qualified staff to carry on effective instructional activities.

- Seven principals stated that their schools tried to improve the learning climate by getting parental and community support for the industrial arts program.

- Five principals suggested that in order to improve the learning climate in industrial arts, the facilities must be functional and properly maintained. This could be achieved by having equipment technicians from the Department of General Education regularly visit schools to provide advice on equipment matters.

- Five principals commented that their schools were using disciplinary standards to create a pleasing learning environment.

Department Heads

- Ten department heads commented that the learning climate of the industrial arts program in their schools could be improved if school administrators provided adequate resources to the industrial arts department.

- Five department heads commented that the industrial arts program in their schools did not received adequate support from the parents and the community since the majority of the parents encouraged their children to take college bound programs.

- Four department heads reported that class sizes in their industrial arts shops were too large. This resulted in students having to wait too long for a turn to use tools and equipment. This created a negative learning environment.

Teachers

- Five teachers suggested that their school administrators should provide more support for industrial arts programs in terms of equipment and facilities.

- Five teachers commented that their school shops lacked sufficient facilities and budget to support the program that was necessary to improve the learning climate of the industrial arts program.

- Three teachers recommended that the industrial arts program learning climate would be much more pleasant if all students in class could be kept busy with activities.

Students

- Five students commented that the ventilation in their school shops was insufficient and that this created a negative learning climate.

- Four students suggested that the learning climate could be improved if more equipment was installed in their shops.

- Four students reported that some of their teachers were not dedicate to teaching and seldom gave assistance to students outside of class time.

Summary - Large Schools

Since section "VII. Evaluation Summary and Suggestions" of the NSSE instrument was not used with the large-size schools, this summary is a synthesis of participant comments as gathered from the various open ended comments provided in other sections of the questionnaire.

There were many concerns centering on lack of facilities, materials, equipment, and supporting budget. A number of stakeholders felt that these shortages necessitated greater efforts at community partnerships. Community partnerships had the potential to enrich the industrial arts programs being offered.

There was an interest by all stakeholders for an industrial arts program that offered a wider variety of course in order to better meet student needs. It appeared that student needs could vary from community to community and that programs needed to be sensitive to community needs. A of major limiting factor in meeting student needs was the lack of facilities and equipment.

The stakeholders felt that although industrial arts teacher were perceived to be generally competent, there was some concern that many of them may not be completely up-to-date with emerging technological trends. It was suggested that adequate in-servicing should be made available to industrial arts teachers to allow them to remain current with rapidly changing technology. This appeared to be a valuable suggestion as a number of industrial arts teachers reported that they had not had the opportunity to attend a seminar or in-service session during their entire teaching career,

All stakeholders expressed a degree of confidence that industrial arts teachers' planning displayed a consistency with program goals and objectives. However, there was concern expressed as to whether or not programs were making the best use of community facilities and resources. There was an underlying feeling that community resources could be used to supplement and enrich industrial arts instructional activities.

There was a concern expressed over the lack (both in quality and quantity) of resource material, study guides and other support material for the industrial arts instructional program. In addition, many schools appeared to lack facilities and equipment to meet the high demands (as exhibited by large class sizes) for the industrial arts program.

There was a plea for more evaluative criteria to be made available to industrial arts teachers to use as guidelines for evaluating student achievement. There was concern expressed that students should be evaluated on more than just their finished products. Attitudes and safety practices were other criteria that were suggested to be worthy of consideration while evaluating student achievement in industrial arts settings. There was also some concern that two many paper-pencil tests rather than practical tests were being used while evaluating student achievement in industrial arts programs.

Many deficiencies were reported in the area of facilities. Classes were often overcrowded and in many instances facilities were reported to be inadequate. There was often inadequate space for demonstration and discussion, improper exhaust equipment, and a lack of non-skid floors in the area of working machines. There was also a general appeal for more storage space for projects and display cases for proper display of finished projects.

There was a chronic budget shortage facing many industrial arts programs. There were claims that much equipment was obsolete and in a state of disrepair and maintenance technicians were not readily available to get the equipment up and running and to keep it running. Too often the equipment and facilities available did not correspond with the latest trends in technology. Not only was some equipment not operable but replacement parts were not readily available.

Some stakeholders suggested that the learning climate in their industrial arts programs could be improved with the provision of sufficient facilities. The idea that more community support for the industrial arts program would improve the learning climate was also expressed. It was felt that many parents encouraged their children to take college bound courses and avoid industrial arts courses. Inadequate facilities and equipment were also mentioned often as reasons for a less than ideal learning climate in some industrial arts classrooms.

CHAPTER V

SUMMARY, FINDINGS, RECOMMENDATIONS, AND OBSERVATION

This study reports the results of an evaluation of the industrial arts program in 34 selected schools in the 12 educational regions in Thailand. Although industrial arts was introduced as a secondary school subject area in Thailand in 1951, an evaluation study of this subject on a nationwide basis had never been done. This study was conducted to identify problems facing the industrial arts programs in secondary schools and to recommend possible solutions to authorities concerned with improvement of these programs. Finally, this study was intended to help determine a relevant industrial arts program for secondary schools in Thailand in the turn of the century.

A supporting objective of this study was to evaluate the following 7 categories in the industrial arts programs of the 34 selected schools:

1. Major Expectations
2. Organization for Instruction
3. Description of Offerings
4. Components of the Instructional Program:
    - (a) faculty;
    - (b) instructional activities;
    - (c) materials and media; and
    - (d) student assessment and program evaluation.

5. Facilities and Equipment

6. Learning Climate

7. Judgments and Recommendations

Each of these 7 categories, excluding Major Expectations, Judgments and Recommendations, included descriptive criteria with a checklist, general evaluation statements, and a section for suggestions. For both descriptive criteria and the general evaluation statements, a 5 point rating scale was used A rating of 5 represented the upper extreme of the curriculum or excellent, and 1 the lower extreme or there is none. If the statement was considered non applicable to the industrial arts program, it was checked as "n" – unnecessary, inappropriate, not corresponding to the need.

The scope of the study was nationwide involving 34 secondary schools in all of the 12 educational regions of Thailand. A Self-Evaluation Committee was formed in each of the 34 sample schools which included small, medium, and large size schools. In each of the 12 small-size schools, the Self-Evaluation Committee consisted of a school principal, an industrial arts teacher who also served as a department head for an industrial arts department, and two industrial arts students. However, for the 12 large-size and 10 medium-size schools the composition of the Self-Evaluation Committees was different. The Self-Evaluation Committee for each of these schools consisted of a principal, an industrial arts department head, two industrial arts teachers, and two industrial arts students.

The instrument used to gather data was the Thai version of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, 1987 of the National Study of School Evaluation (NSSE). Prior to translating these criteria the researcher requested and was granted permission from the Executive Director of NSSE to translate them into Tai.

After permission to conduct the study in Thailand was granted by the Deputy Director General, Department of General Education, Ministry of Education, the researcher traveled to Thailand in April 1993 to select the schools and to conduct the research. The researcher made site visits to the 34 selected schools beginning in May, 1993 and ending in September of that year.

At each school site, the researcher met with members of a Self-Evaluation Committee to explain to them the purpose of the study and the process they were to use to complete the research instrument. In addition, the members of the Self-Evaluation Committees were informed that their participation was voluntary, their identities would remain anonymous, and that research ethics of the University of Alberta would be strictly adhered to.

The researcher returned to the University of Alberta in October, 1993 were the collected data were analyzed and a frequency distribution and a percent for the various ratings were calculated.

For the purpose of analyzing the data, the researcher established three cut-off points – "High," "Adequate" and "Low." Statements rated either 5, excellent or 4, good by 75% to 100% of the participants were placed in the "High" category. Criteria with ratings of between 25% to 74% were placed in the "Adequate" category and those with ratings below 24% were placed in the "Low" category. Any criteria rate "n" was eliminated from the research. Suggestions that were made by participants for each section and its subsection were analyzed and organized thematically.

The remainder of this chapter will present the findings, recommendations and observation.

Findings

A common instrument was used to collect data in the three sizes of schools. Of the seven categories contained in the research instrument five had three sections: a descriptive criteria section, an evaluative statement section and a suggestion section. The first two sections of each category were used to collect quantitative data and the last section to collect qualitative data. Quantitative data were used to structure each table for each size of school.

Funding

There was a consensus among the three types of Self-Evaluation Committees that the lack of funding was a major hindrance in the operation of the industrial arts program. This lack of funding had a major impact in many areas of the program. Obsolete equipment could not be replaced and inoperable equipment could not be repaired. There was a lack of appropriate funding for the purchase of shop materials, instructional materials, and adequate and proper safety equipment for both machine and personal safety.

Community Cooperation

There was a consensus among the three types of Self-Evaluation Committees that the lack of community cooperation was a major hindrance in the operation of the industrial arts program. It was felt that better cooperation between the schools and the community would allow for the use of community facilities, resource people and funding to improve the quality of the industrial arts program. In many instances community equipment was more up-to-date with current technologies than school equipment.

Facilities

There was a consensus among the three types of Self-Evaluation Committees that inadequate facilities were a major hindrance in the operation of the industrial arts program. The facilities were inadequate to handle student enrolment.

They were designed for the industrial model of the 1950s and due to a lack of funding have not been able to keep pace with technological advancement. They lacked adequate ventilation for dust and fume control.

Equipment

There was a consensus among the three types of Self-Evaluation Committees that the equipment was a major hindrance in the operation of the industrial arts program. A number of pieces of equipment were obsolete. Other pieces were inoperable and unable to be repaired due to the unavailability of replacement parts. In some instances teachers lacked the necessary competencies to repair the equipment and although the technical expertise to repair the equipment was available locally, funding to employ this expertise did not exist.

Curriculum Revision

There was a consensus among the three types of Self-Evaluation Committees that the lack of curriculum revision had created a stagnant program. One of the weaknesses of the curriculum was that it lacked adequate and proper goals to provide direction for instruction. The curriculum is based on the industrial model of the 1950s an should be revised to make it more reflective of changes in technology and changes in instructional delivery methods. The current curriculum was considered to be weak because it did not include clear standards off assessment for evaluating student performance. A number of problems were mentioned in conjunction with student assessment. It was heavily subjective, tended to ignore such things as attitudes and skills and focused on the finished product. In addition the assessment devices used were biased toward theory (paper-pencil tests) instead of toward the practical.

Technology Model

There was a consensus among the three types of Self-Evaluation Committees that the present curriculum paradigm (the industrial model) needed to be revised and directed more toward the technology model. An integral part of the technology model would see program emphasis shifted from the teacher to the student.

Teacher In-service

The lack of teacher in-service seemed to pose a two pronged problem. Those teachers who came from industry without a teacher education background could not fill this void. Those teacher who were graduates of teacher education programs had no opportunity to upgrade their skills or knowledges through in-service. The students were critical of the teachers in a number of ways. They did not find the teachers readily available outside of class time, nor did they feel that teachers treated them as individuals.

Role of Supervisor

The teachers in the small size schools were critical of the supervisors from the Department of General Education in terms of their interpersonal relations skills. The relationship was hierarchical rather than collegial.

Recommendations

The recommendations for this study are based upon the research findings. These recommendations are directed at the Ministry of Education, Department of General Education.

1. Additional funding that provides for an inflationary factor should be provided on an "evergreen" basis. These funds should be of three types, capital, operating, and equipment maintenance with no crossovers possible.

2. A conscientious effort needs to be made to explore the types of collaborative ventures that might be mutually beneficial to school and community groups in the industrial arts program.

3. A long range plan needs to be developed for the renovation and construction of new facilities that meet the standards established for industrial arts education. These

plans should address standards concerned with dust and fume control as well as equipment and personal safety.

4. A long range plan should be established for the purchase of new equipment and the modification and repair of inoperable equipment. This plan should also address the ongoing needs of equipment maintenance. This could best be accomplished by some combination of teacher expertise in equipment repair and teacher ability to access qualified local technicians when necessary.

5. A long range plan should be established for curriculum revision This plan should be based upon a three to five year cycle and needs to pay particular attention to presenting clear and achievable goals that are relevant to the students. This curriculum needs to address a paradigm shift from the industrial model to the technology model so that students who complete the programs will be technologically literate for the 21st century.

6. A long range plan should be established for teacher in-service. This plan needs to address two groups – teachers recruited from industry with little or no teacher preparation background and graduates of teacher education programs who have not been in-serviced since graduation.

7. Tool and equipment competencies and interpersonal skills should be prime requisites for individuals appointed to the role of supervisor.

Observation

In retrospect, it may have been to the advantage of the study had statements from the NSSE evaluative criteria directed at the handicapped been retained.

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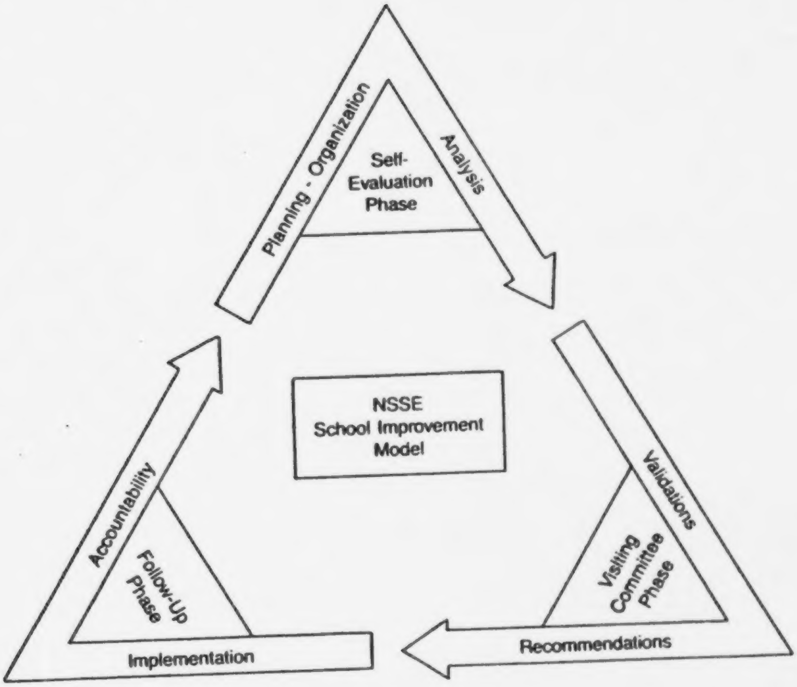
Appendices

Appendix A

SECTION

4-16

TECHNOLOGY EDUCATION (INDUSTRIAL ARTS)


Planning - Organization
Self-Evaluation Phase
Analysis
NSSE School Improvement Model
Accountability
Follow-Up Phase
Implementation
Validations
Visiting Committee Phase
Recommendations

EVALUATIVE CRITERIA SIXTH EDITION

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SECTION 4-16 — TECHNOLOGY EDUCATION (INDUSTRIAL ARTS)

INSTRUCTIONS

The two fundamental guidelines for school evaluation are (1) *the characteristics of the school and community and* (2) *the school's philosophy and goals.* Therefore, Section 2, "School and Community," and Section 3, "Philosophy and Goals," should be kept in mind when the items of this section are being completed. While making evaluations persons should ask: "How well do the practices in this school meet the needs of the school and community?" and "How well do the practices conform to the philosophy and goals of this school?" When evaluations are made, factors such as size, type, location of school, financial support and state requirements should not be used to justify failure to provide a program or facilities appropriate to the needs of the school and community consistent with the philosophy and goals of the school. Also, the two-fold nature of the process—evaluation and stimulation to improvement—should be kept in mind. Careful, discriminating judgments are essential if these purposes are to be satisfactorily achieved.

Faculty members conducting self-evaluations are encouraged to modify the major expectations and the descriptive criteria when necessary to make them congruent with their school's philosophy and goals and the characteristics of their school and community. In those instances in which significant changes are made, the reasons for the changes should be identified unless otherwise obvious. The "Supplementary Data" subsection should be completed prior to responding to the descriptive criteria. These data will assist in responding to the descriptive criteria and evaluations.

Descriptive Criteria

The descriptive criteria should be judged on the following scale:

5 Excellent
4 Good
3 Satisfactory
2 Poor
1 Missing But Needed
na Not Applicable

In the process of arriving at a single numerical rating for an item, the self-evaluation subcommittees and/or the visiting committee members are asked to consider both the extent to which provisions exist and the adequacy with which they are functioning. In those instances in which significant disparity exists between the provision for and the function or utilization of an item observed, a description or recommendation should be included in the self-evaluation and/or the visiting committee report. (Example: If classrooms are exceptionally well equipped but limited use is made of the equipment, the evaluator(s) should assign a less than excellent rating and call attention to the fact that even though the facilities are excellent, their ineffective use results in a lower rating.)

Questions frequently arise about the meaning of points on the scale. A definitive answer is extremely difficult to give. In any entity as complex as a school, it is not easy to describe in detail what "excellent" or "poor" really means on the hundreds of items requiring judgments. The evaluators must draw upon their total professional experiences and make a judgment on the basis of those experiences. Keep in mind that 5 does not mean ideal or perfect. Some schools are probably underrated in the self-evaluation because some evaluators believe that 5 should be reserved for an unattainably high condition.

Each person who makes an evaluation should try to be accurate in assessing each item. *If a slight change in the wording of an item would make it more appropriate to the school being evaluated, such a change should be made. If important elements of the school's program are omitted, the subcommittee members are encouraged to add descriptive criteria, supplementary data, evaluation items and comments to make the description more complete.* A descriptive criterion may be divided if it appears to have two subjects that are sufficiently different to require individual attention.

Let us consider an example in the use of the scale that examines the statement, "Classrooms are equipped with demonstration facilities." If, in your judgment, the classrooms are equipped with demonstration facilities that are some of the best that you have seen, circle the number "5." If you decide that the demonstration facilities are good but not the best, circle the number "4." Should the demonstration facilities be satisfactory, circle the number "3." If the demonstration facilities are poor, circle the number "2." If the demonstration facilities are necessary but nonexistent, circle the number "1." Should the demonstration facilities be unnecessary, circle "na."

Evaluations

Responses to the descriptive criteria form an information profile reflecting the specific characteristics of a particular aspect of the total area under study. This profile is to be used when responding to the questions under evaluations. The responses to the evaluations should reflect an overall summary judgment of the particular aspect described in detail by the responses to the descriptive criteria.

Comments

The space under the heading "Comments" at the end of each subsection should be used to include additional information needed to provide a comprehensive report of that area and to describe any condition that is not adequately covered elsewhere in the subsection. The space can also be used to clarify or amplify descriptive criteria or evaluations.

Subcommittees are encouraged to use the space under the heading "Comments" any time it will aid in describing the areas or in explaining a judgment.

Structure of this Section

To facilitate description and judgment, this subject area section is structured using the following subsections:

I. Major Expectations
√II. Follow-Up to Previous Evaluations
III. Organization for Instruction
IV. Description of Offerings
V. Components of the Instructional Program
VI. Facilities and Equipment
VII. Learning Climate
√VIII. Evaluations
IX. Judgments and Recommendations

TECHNOLOGY EDUCATION (INDUSTRIAL ARTS)

Name of School ______________________________ **Date** ______________

Self-evaluation by:

(Name)	(Position)	(Name)	(Position)	(Name)	(Position)
(Name)	(Position)	(Name)	(Position)	(Name)	(Position)
(Name)	(Position)	(Name)	(Position)	(Name)	(Position)

I. MAJOR EXPECTATIONS

These expectations are offered for your acceptance,
rejection or modification. Please feel free to make changes.

Expectations are those expressed beliefs that govern the activities of personnel and organizations. Major expectations communicate the substance and anticipated outcomes of school programs. They are the reference from which behaviors are judged to be reasonable, necessary or appropriate by all school participants. Expectations are expressed in the form of goals and organizational procedures. Expectations should be consistent with district and school goals and be reflected in the formation of student programs. They are expressed in the day-to-day activities of personnel. However expressed, expectations become the most powerful standards for quality in a school.

✓ Industrial arts education has evolved to technology education. The term "technology education" rather than "industrial arts" will be used throughout this section. Technology education may be defined as a comprehensive, action-based educational program concerned with evolution, utilization and significance of technical means for accomplishing a task with the organization, personnel, systems, techniques, resources and products of industry; and their social/cultura impact.

Because the American culture is distinctly characterized as technological, it becomes the function of schools to provide every student with the opportunity to develop insight into the technological nature of our culture. This is what the program of technology education strives to do. It acquaints all persons with their technological environment so that they can make rational decisions about their own lives on a day-to-day basis and eagerly participate in controlling their own destinies. Technology education courses should be flexible enough to allow for a wide variety of student interests and needs.

Technology education capitalizes on the individual's native potential for reasoning and problem solving, for imagining and creating, for constructing and expressing with tools and materials. It develops content and experiences to contribute to the growth and development of human beings commensurate with their potential. Thus, technology education is a basic and fundamental study for all persons, regardless of educational or career goals, even if related specialized vocationa programs are offered.

The secondary school technology education program is technological in nature and is designed to provide all students with an in-depth foundation for career preparation at the secondary or postsecondary levels. Students will develop consumer awareness and personal enrichment as well as occupational readiness. Students pursuing engineering and scientific careers in colleges or universities will find technology education courses beneficial. Also, students will develop transferable skills for life and further education. The program complements the middle or junior high school curriculum and offers sequential courses that build on previously learned content without repetition.

✓ The following are major expectations commonly associated with an effective technology education program.

- Practical application of basic scientific and mathematical principles is experienced.
- Students make decisions regarding postsecondary technology careers, engineering programs or service-related fields
- Students make decisions with regard to advanced vocational education programs.
- Students gain an in-depth understanding and appreciation for technology in our society and culture.
- Students develop basic skills in the proper use of tools, machines, materials and processes.
- Students solve problems involving the tools, machines, materials, processes, products and services of industry an technology.

I. MAJOR EXPECTATIONS — Continued

NOTES: a. *Any additional major expectations that have been formulated for the school's technology education program should be recorded in the space provided.*

b. *Attach a copy of the technology education program's philosophy, goals and instructional objectives.*

1. Indicate the extent to which the expectations for the technology education program are consistent with:

a. The school and community characteristics.

b. The philosophy and goals of the total school program.

2. Indicate the extent of the commitment to these expectations.

3. Indicate the extent to which these expectations are appropriate for the needs and interests of the students.

4. Indicate any problems in achieving these expectations.

II. FOLLOW-UP TO PREVIOUS EVALUATIONS

1. Describe three to five significant changes currently in effect resulting from the recommendations of previous accreditation evaluations, state educational agency reports, legislation, local assessments, follow-up studies, opinion inventory surveys, needs assessments, etc. (specify the source of the impetus for change).

2. Describe any recommendations of more than three-years standing resulting from accreditation evaluations that have not been implemented and indicate the rationale for those decisions.

III. ORGANIZATION FOR INSTRUCTION

Descriptive Criteria

1. A current, comprehensive and written rationale for including technology education as an integral part of the total school curriculum has been developed .... 5 4 3 2 1 na
2. The program's philosophy, goals and objectives were developed through the cooperative efforts of administrators, teachers, students, parents, representatives from business and industry, and other consultants 5 4 3 2 1 na
3. The program's philosophy, goals and objectives are consistent with local, state and national philosophies, goals and objectives for technology education .... 5 4 3 2 1 na
4. The program's philosophy, goals and objectives are the basis for program planning, development, implementation and evaluation .... 5 4 3 2 1 na
5. The philosophy, goals and objectives are reviewed periodically and revised when necessary .... 5 4 3 2 1 na
6. Courses offered in the broad systems of communication, construction, manufacturing and transportation reflect course objectives 5 4 3 2 1 na
7. Courses are planned and scheduled to allow program objectives to be achieved .... 5 4 3 2 1 na
8. All students, regardless of their race, sex, creed or needs, are admitted to and served by the program .... 5 4 3 2 1 na
9. The program is up-dated regularly to meet the needs and interests of all students ... 5 4 3 2 1 na
10. Sufficient funds are budgeted and expended to operate and maintain the program for the accomplishment of goals and course objectives consistent with student enrollment and unique student needs .... 5 4 3 2 1 na
11. Adequate school support services, such as guidance personnel, secretarial and clerical assistance, custodial help and maintenance services are provided to support the program .... 5 4 3 2 1 na
12. The teachers identify and utilize people in the community to assist in achieving program goals and course objectives .... 5 4 3 2 1 na
13. An advisory committee is established and utilized to support program goals and course objectives .... 5 4 3 2 1 na
14. The educational community, the lay public, business, industry and government are informed of and given the opportunity to participate in the program .... 5 4 3 2 1 na
15. 5 4 3 2 1 na

III. ORGANIZATION FOR INSTRUCTION — Continued

Supplementary Data

If necessary and/or more convenient, data may be provided on extra sheets attached to this section in lieu of the space provid

(Complete the following table for all technology education courses; revise as necessary where schedules are modular, block or cycle other than supplement as necessary with attachments.)

Title of Course	Required or Elective		Grade Level(s)	Enrollment		Credit Value	No. of Sections	Range of Class Size	Per Week	
	R	E		M	F				No. of Periods (Mods)	Total Min.

Evaluations

1. To what extent are the philosophy, goals and objectives implemented? 5 4 3 2 1
2. To what extent are courses available to all students? 5 4 3 2 1
3. How appropriate are schedules, time allotments and class sizes for course offerings? 5 4 3 2 1
4. How adequate is financial support for the program? 5 4 3 2 1
5. How adequate is the cooperative planning of technology education? 5 4 3 2 1
6. To what extent are in-school and out-of-school resources used? 5 4 3 2 1
7. To what extent is information regarding the program effectively communicated to students, parents and the community? 5 4 3 2 1

Comments

IV. DESCRIPTION OF OFFERINGS

Descriptive Criteria

At all levels, the program content is based on:

1. An organized set of technological concepts, processes and systems .... 5 4 3 2 1 na
2. Knowledge about the development of technology and its effect on people, the environment and culture .... 5 4 3 2 1 na
3. ✓ Instructional content drawn from one or more of the areas of communication, construction, manufacturing and transportation .... 5 4 3 2 1 na
4. Assisting students in developing insight, understanding and application of technological concepts, processes and systems .... 5 4 3 2 1 na
5. Applying tools, materials, machines, processes and technical concepts safely and efficiently .... 5 4 3 2 1 na
6. Developing skills, creative abilities, positive self-concepts and individual potentials in technology .... 5 4 3 2 1 na
7. Developing problem-solving and decision-making abilities involving human and material resources, processes and technological systems .... 5 4 3 2 1 na
8. Preparing students for lifelong learning in a technological society .... 5 4 3 2 1 na
9. Activity-oriented laboratory instruction that reinforces abstract concepts with concrete experiences .... 5 4 3 2 1 na
10. A combined emphasis on "know-how" and "ability to do" in carrying out technological work .... 5 4 3 2 1 na
11. 5 4 3 2 1 na

Evaluations

1. To what extent are the information and experiences in the program related to technology? .... 5 4 3 2 1 na
2. To what extent are scope and sequence of courses related to the interests, abilities and developmental needs of students? .... 5 4 3 2 1 na
3. To what extent do the offerings provide for creative and problem-solving experiences with a variety of tools, materials and technological concepts? .... 5 4 3 2 1 na
4. To what extent do students develop fundamental knowledge about the development of technology and its effect on people, the environment and culture? .... 5 4 3 2 1 na
5. To what extent is student responsibility and leadership developed? .... 5 4 3 2 1 na
6. How flexible is the program for meeting the needs of all students? .... 5 4 3 2 1 na
7. To what extent do students exhibit safe working habits? .... 5 4 3 2 1 na

Comments

V. COMPONENTS OF THE INSTRUCTIONAL PROGRAM

A. FACULTY

For data on preparation of faculty see Section 12, "Individual Faculty Member."

Descriptive Criteria

Members of the technology education faculty:

1. Meet the established state and local degree, certification and competency requirements 5 4 3 2 1 na
2. Are competent in researching, planning, organizing, directing and evaluating activities in the program .... 5 4 3 2 1 na
3. Are broadly prepared and certificated in the systems of communication, construction, manufacturing and transportation .... 5 4 3 2 1 na
4. Are technically competent in the assigned teaching area(s) .... 5 4 3 2 1 na
5. Are prepared through preservice/inservice education to eliminate sex bias and sex-role sterotyping .... 5 4 3 2 1 na
6. Are prepared through preservice/inservice education to provide experiences for students with special needs .... 5 4 3 2 1 na
7. Are prepared through preservice/inservice education to organize and operate a local Association of Industrial Arts Students of America .... 5 4 3 2 1 na
8. Through preservice/inservice education, have knowledge of the legal and liability requirements of classroom/laboratory operation .... 5 4 3 2 1 na
9. Are members of and actively participate in professional and technical organizations related to technology education 5 4 3 2 1
10. Have a professional development plan for maintaining and expanding professional and technical teaching competencies 5 4 3 2 1
11. Maintain current knowledge in technology education through activities such as reading professional and technical publications ... 5 4 3 2 1
12. Plan and implement instruction in cooperation with counselors and other appropriate support personnel 5 4 3 2 1
13. Have rapport with business and industry in the area 5 4 3 2 1
14. Adhere to a written code of ethics related to the performance of professional teaching responsibilities 5 4 3 2 1
15. Demonstrate adequate and appropriate written and oral language skills 5 4 3 2 1
16. 5 4 3 2 1

Supplementary Data

If necessary and/or more convenient, data may be provided on extra sheets attached to this section in lieu of the space provi

1. Indicate the number of faculty in each of the following categories (do not count the same individual more than once in any one category).
   a. Educational level:
      Less than Bachelor's degree ________
      Bachelor's degree ________
      Master's degree ________
      Post Master's degree/Certificate ________
      Doctor's degree ________
   b. Semester hours (approximate) of preparation in technology education:
      0-11 ________
      12-23 ________
      24-48 ________
      More than 48 ________
   c. Certification status in technology education:
      Certificated ________
      Non-certificated ________
   d. Years of experience in technology education:
      0-2 ______
      3-5 ______
      6-15 ______
      More than 15 ______
2. Indicate the number of teachers involved in the follow faculty development activities during the past three ye
   School sponsored inservice programs ______
   Summer workshops ______
   College courses ______
   Institutes ______
   Other ______
   a. ______
   b. ______
   c. ______
   d. ______

Supplementary Data — Continued

3. Indicate the subject-related organizations in which faculty members hold membership and the number of faculty belonging to each organization.

	NAME OF ORGANIZATION	NUMBER OF FACULTY
Local		
State		
National		

Evaluations

1. How adequate is the preparation of faculty members in the subjects they teach? .... 5 4 3 2 1 na
2. ✓ To what extent does faculty members keep informed about current educational developments in their teaching area? 5 4 3 2 1 na
3. To what extent does the faculty demonstrate continued commitment to professional growth? .... 5 4 3 2 1 na
4. To what extent does the faculty possess a well-defined point of view toward technology education? .... 5 4 3 2 1 na

Comments

B. INSTRUCTIONAL ACTIVITIES

Descriptive Criteria

1. Teachers plan, prepare or obtain written courses of study designed to develop student competencies consistent with program goals and course objectives .... 5 4 3 2 1 na
2. Teachers plan and prepare current lesson plans based on the course of study and student needs .... 5 4 3 2 1 na
3. Teachers develop and/or obtain appropriate, up-to-date instructional materials .... 5 4 3 2 1 na
4. Teachers plan and provide for evaluating the effectiveness of their instruction .... 5 4 3 2 1 na
5. Alternatives and appropriate methods to assist students in meeting course objectives are provided by teachers .... 5 4 3 2 1 na
6. Students develop an insight and understanding of the technological society as a result of activities in courses .... 5 4 3 2 1 na
7. Emphasis is placed upon improving student ability to make informed and meaningful career choices .... 5 4 3 2 1 na
8. Technology education prepares students for collegiate and/or advanced vocational/technical programs and equips them with universally transferable technological skills ..... 5 4 3 2 1 na
9. Emphasis is placed upon preparing students for lifelong learning in a technological society .... 5 4 3 2 1 na
10. Instructional activities develop student skills, positive self-concepts and individual potentials in technology .... 5 4 3 2 1 na
11. Instructional activities are designed to teach the application of tools, materials, machines, processes and technical concepts safely and efficiently 5 4 3 2 1
12. Instructional activities promote the development of process skills such as creative and critical thinking, decision making and problem solving 5 4 3 2 1
13. Both teacher-centered and student-centered instructional methods are utilized .. 5 4 3 2 1
14. Opportunities for multi-disciplinary learning are provided by the program 5 4 3 2 1
15. Both group and individual student learning activities are utilized 5 4 3 2 1
16. Student leadership skills are developed through a variety of curricular and co-curricular activities 5 4 3 2 1
17. The activities of the local Association of Industrial Arts Students of America chapter are an integral part of the planned courses of study and are utilized in conducting classroom and laboratory activities 5 4 3 2 1
18. Instructional strategies appropriate for serving students with special needs have been identified and incorporated into the program 5 4 3 2 1
19. Community resources are used to supplement instruction where appropriate 5 4 3 2 1
20. Students utilize in-school and out-of-school resources in fulfilling assignments 5 4 3 2 1
21. 5 4 3 2 1

Evaluations

1. How effectively do instructional activities relate to students' needs and program goals? 5 4 3 2 1
2. How adequate are the planning and preparation for the instructional program? 5 4 3 2 1
3. How effectively are community resources incorporated into the instructional program? 5 4 3 2 1
4. How effectively do teachers work with faculty in other academic areas to provide better instruction? 5 4 3 2 1

Comments

C. MATERIALS AND MEDIA

Descriptive Criteria

1. A wide and balanced range of reading materials is available for students .... 5 4 3 2 1 na
2. Materials provide for different levels of student abilities .... 5 4 3 2 1 na
3. ✓A variety of instructional equipment is available and used .... 5 4 3 2 1 na
4. Resource units, study guides and other support materials are available and used .... 5 4 3 2 1 na
5. Instructional materials are adequate to meet program goals ....✓. 5 4 3 2 1 na
6. Instructional materials provide for simulated occupational experiences .... 5 4 3 2 1 na
7. Adequate provisions are made for the use of computer hardware and software .... 5 4 3 2 1 na
8. Instructional materials, language and strategies are free of sex and race bias and stereotyping .... 5 4 3 2 1 na
9. Provisions of the copyright law dealing with the reproduction and utilization of copyrighted materials are observed .... 5 4 3 2 1 na
10. Guidelines have been established for the selection of new instructional materials .... 5 4 3 2 1 na
11. Faculty members participate on a regular basis in decisions related to the selection of new materials .... 5 4 3 2 1 na
12. Teachers consult regularly with media faculty about the acquisition and utilization of resources and services .... 5 4 3 2 1 na
13. A professional library of current publications and periodicals is accessible to the teachers .... 5 4 3 2 1 na
14. Place a check by each item readily available for teacher use and rate the adequacy of each:
    - ____ books .... 5 4 3 2 1 na
    - ____ periodicals .... 5 4 3 2 1 na
    - ____ maps .... 5 4 3 2 1 na
    - ____ charts .... 5 4 3 2 1 na
    - ____ transparencies .... 5 4 3 2 1 na
    - ____ slides .... 5 4 3 2 1 na
    - ____ computer software .... 5 4 3 2 1 na
    - ____ other ____________________ .... 5 4 3 2 1 na

    A variety of instructional materials is available .... 5 4 3 2 1 na
15. There is evidence that students and teachers are making use of the variety of instructional materials available to them .... 5 4 3 2 1 na
16. Career exploration and development materials are available .... 5 4 3 2 1 na
17. Suitable methods are used for ordering and keeping an inventory of materials and media 5 4 3 2 1 na
18. Annual budget provisions are made for the purchase of consumable supplies and resource materials .... 5 4 3 2 1 na
19. Adequate storage is provided for materials and media .... 5 4 3 2 1 na
20. 5 4 3 2 1 na

Evaluations

1. How adequate is the scope of instructional materials and media? .... 5 4 3 2 1 na
2. How adequate is the quality of instructional materials and media? .... 5 4 3 2 1 na
3. How adequate is the quantity of instructional materials and media? .... 5 4 3 2 1 na
4. How accessible are instructional materials to the students and teachers? .... 5 4 3 2 1 na
5. How well are instructional materials organized and maintained? .... 5 4 3 2 1 na
6. How well are instructional materials utilized by faculty and students? .... 5 4 3 2 1 na
7. How adequate is the provision for the storage of instructional materials? .... 5 4 3 2 1 na

Comments

D. STUDENT ASSESSMENT AND PROGRAM EVALUATION

Descriptive Criteria

1. Student assessment is an integral part of instruction .... 5 4 3 2 1 na
2. The student assessment process provides for individual differences .... 5 4 3 2 1 na
3. Results of the student assessment process are reported to students, teachers and parents .... 5 4 3 2 1 na
4. Results of the student assessment process are used for:
   a. diagnosing students' developmental characteristics, learning styles and knowledge/skill levels .... 5 4 3 2 1 na
   b. determining achievement levels ...... 5 4 3 2 1 na
   c. assessing students' strengths and weaknesses .... 5 4 3 2 1 na
   d. determining students' abilities to use knowledge in new situations .... 5 4 3 2 1 na
   e. counseling students .... 5 4 3 2 1 na
5. A continuous evaluation of the program determines the extent to which established major expectations, goals and objectives are being met .... 5 4 3 2 1 na
6. Program evaluation is carried out through a variety of measurement formats (methods) that match the characteristics of the students and the nature of instructional objectives 5 4 3 2 1
7. Program outcomes and student performance are measured on the basis of data that have been appropriately collected, analyzed and interpreted 5 4 3 2 1
8. Results of the program evaluation process are used for determining teacher and program effectiveness 5 4 3 2 1
9. Results of the program evaluation process are used for making program changes ... 5 4 3 2 1
10. 5 4 3 2 1

Supplementary Data

If necessary and/or more convenient, data may be provided on extra sheets attached to this section in lieu of the space provid

1. Describe the student assessment program.

2. Describe how the student assessment program is used to evaluate:

   a. Strengths, weaknesses and yearly growth of individual students.

Supplementary Data — Continued

b. Grade level achievement in terms of national, regional, state, local or other norms.

c. Grade level weaknesses.

Evaluations

1. How adequately does the student assessment program provide for individual differences? .... 5 4 3 2 1 na
2. How effectively are the results of the student assessment program used for:
   a. diagnosing students' developmental characteristics, learning styles and knowledge/skill levels? .... 5 4 3 2 1 na
   b. assessing students' strengths and weaknesses? .... 5 4 3 2 1 na
   c. assessing achievement? .... 5 4 3 2 1 na
   d. assessing students' abilities to use knowledge in new situations? .... 5 4 3 2 1 na
   e. counseling students? .... 5 4 3 2 1 na
3. How adequate is the reporting of the results to teachers, students and parents? .... 5 4 3 2 1 na
4. How effectively are a variety of measurement formats (methods) used in the program evaluation and student assessment processes? .... 5 4 3 2 1 na
5. How adequate is the collection, analysis and interpretation of the data? .... 5 4 3 2 1 na
6. How effectively are the results of the evaluation program used to assess teaching effectiveness? .... 5 4 3 2 1 na
7. How effectively are the results of the evaluation program used to make program changes? .... 5 4 3 2 1 na
8. How adequate is the evaluation program in determining the overall effectiveness of the program? .... 5 4 3 2 1 na

Comments

VI. FACILITIES AND EQUIPMENT

Descriptive Criteria

Facilities

1. The instructional areas are located so that they are convenient to the common uses and in close proximity to related instructional areas .... 5 4 3 2 1 na
2. The instructional areas provide appropriate spaces to accommodate a variety of instructional activities .... 5 4 3 2 1 na
3. The instructional areas provide spaces to meet the needs of the handicapped ...... 5 4 3 2 1 na
4. The laboratory floor area is consistent with accepted standards for instructional activities .... 5 4 3 2 1 na
5. Adequate lavatory facilities for both sexes are provided in close proximity .... 5 4 3 2 1 na
6. Adequate office space is provided for each teacher .... 5 4 3 2 1 na
7. A demonstration and discussion area with adequate student space is provided ...... 5 4 3 2 1 na
8. Ceiling height is appropriate for activities being conducted .... 5 4 3 2 1 na
9. The instructional areas have provisions for the adequate control of heat, light, ventilation and acoustics .... 5 4 3 2 1 na
10. Proper exhaust equipment for removing fumes and particulates from the instructional areas is provided .... 5 4 3 2 1 na
11. The instructional areas are provided with the appropriate utilities .... 5 4 3 2 1 na
12. The instructional areas meet all safety regulations .... 5 4 3 2 1 na
13. Safety barriers, zones and aisles are properly marked .... 5 4 3 2 1 na
14. Floors and all other surfaces are kept free of waste materials, grease and obstructions . 5 4 3 2 1 na
15. Floors have non-skid surfaces, with special application on machine-operated work areas 5 4 3 2 1
16. Each laboratory with power equipment has the equivalent of one easily accessible emergency disconnect switch (panic button) per perimeter wall 5 4 3 2 1
17. Fire extinguishers of the correct class are provided in appropriate locations and are inspected regularly 5 4 3 2 1
18. A first-aid kit and related emergency supplies are provided in accordance with local regulations 5 4 3 2 1
19. Color-coding schemes for safety purposes are used throughout the laboratory 5 4 3 2 1
20. Lockable master switch boxes are located in each laboratory 5 4 3 2 1
21. The instructional areas provide adequate, safe and secure storage for supplies and equipment 5 4 3 2 1
22. Adequate storage is provided for individual and group projects under construction as well as for items in the assembling and finishing stage 5 4 3 2 1
23. Display cases of sufficient size, properly lighted and appropriately located, are provided 5 4 3 2 1
24. Appropriate storage lockers are provided for students 5 4 3 2 1
25. Approved safe cabinets, containers or rooms are provided to store radioactive, flammable and corrosive materials 5 4 3 2 1
26. 5 4 3 2 1

VI. FACILITIES AND EQUIPMENT — Continued

Supplies and Equipment

1. There is a variety of educational equipment and supplies available to carry out the instructional program .... 5 4 3 2 1 na
2. Specially designed or modified tools, machines and equipment are provided for students with special needs .... 5 4 3 2 1 na
3. Facilities and equipment are provided for using audiovisual instructional materials . 5 4 3 2 1 na
4. Adequate chalkboards and bulletin boards are provided .... 5 4 3 2 1 na
5. There are adequate supplies and equipment available to carry out the instructional program .... 5 4 3 2 1 na
6. The equipment is well-maintained and meets all safety requirements .... 5 4 3 2 1 na
7. All machines and power tools are provided with approved commercial guards and safety devices .... 5 4 3 2 1 na
8. Safety guards remain in place, except when the equipment is disconnected for cleaning, repair or adjustment .... 5 4 3 2 1 na
9. Any machine, tool, instrument or device found to be unsafe is removed from service and marked accordingly .... 5 4 3 2 1 na
10. Conveniently located magnetic control switches and/or control boxes and braking devices are provided for appropriate machines .... 5 4 3 2 1 na
11. State or federally approved eye protection devices are required for all persons exposed to conditions that could cause eye injury . 5 4 3 2 1 na
12. State or federally approved ear protection devices are required for all persons exposed to conditions that could cause ear damage 5 4 3 2 1 na
13. State or federally approved respiratory protection devices are required for all persons exposed to conditions that could cause respiratory problems .... 5 4 3 2 1 na
14. State or federally approved head protection devices are required for all persons exposed to conditions that could cause head injury 5 4 3 2 1 na
15. Specially adapted personal protection devices are available for and used by students with special needs .... 5 4 3 2 1 na
16. Teachers and students wear appropriate clothing when exposed to conditions that warrant such protection .... 5 4 3 2 1 na
17. Personal protection devices requiring sanitation are sanitized after each use .... 5 4 3 2 1 na
18. Corrective and preventive maintenance is performed within a reasonable time following written notification to the appropriate administrator .... 5 4 3 2 1 na
19. The furniture is appropriate for the instructional program .... 5 4 3 2 1 na
20. Machines and tools are placed, mounted if necessary, and arranged in a safe and functional manner .... 5 4 3 2 1 na
21. 5 4 3 2 1 na

Evaluations

1.✓ To what extent are the facilities and equipment conducive to the achievement of the major expectations, goals and objectives? .... 5 4 3 2 1 na
2. How adequate is the space for instructional activities? .... 5 4 3 2 1 na
3. How adequate are equipment and facilities for instructional activities? .... 5 4 3 2 1 na
4. To what extent are the facilities and equipment effectively used for instructional activities? .... 5 4 3 2 1 na
5. How adequate are the storage facilities for supplies and equipment? .... 5 4 3 2 1 na
6. How well is equipment maintained for efficient use? .... 5 4 3 2 1 na
7. How adequate are the maintenance and general cleanliness of laboratories? .... 5 4 3 2 1 na

Comments

VII. LEARNING CLIMATE

Descriptive Criteria

1. The major expectations, goals and objectives reflect a clear sense of purpose ..... 5 4 3 2 1 na
2. The faculty is competent and dedicated .. 5 4 3 2 1 na
3. The school administration provides adequate resources and encouragement to the department ..... 5 4 3 2 1 na
4. School administration and faculty exhibit high expectations for student achievement 5 4 3 2 1 na
5. Parental and community support exists for the program ..... 5 4 3 2 1 na
6. The instructional program is based on the appropriate diagnosis of students' developmental characteristics, learning styles and knowledge/skill levels ..... 5 4 3 2 1 na
7. Student placement in the program is predicated on adequate faculty advisement and on the development of individual student plans 5 4 3 2 1 na
8. Classroom organization provides for optimum use of instructional time .... 5 4 3 2 1 na
9. Instructional methods and strategies facilitate the performance of individual students 5 4 3 2 1 na
10. All students are provided opportunity and assistance to achieve both the required program and individual student goals .... 5 4 3 2 1 na
11. Students are provided frequent feedback about their performance ..... 5 4 3 2 1 na
12. The appraisal of teacher performance is oriented toward improvement of instruction . 5 4 3 2 1 na
13. Students' self-esteem is enhanced by positive relationships and mutual respect among peers and teachers ..... 5 4 3 2 1 na
14. School and classroom disciplinary standards promote a positive learning environment . 5 4 3 2 1 na
15. Students and teachers are recognized for achieving the objectives of the program .. 5 4 3 2 1 na
16. The facilities are aesthetically pleasing, functional, safe and properly maintained . 5 4 3 2 1 na
17. 5 4 3 2 1 na

Supplementary Data

Attach summary sheets of any school climate survey and student, teacher or parent/community satisfaction surveys administered by the department.

Evaluations

1. To what extent does the learning climate of this department support the attainment of the program's major expectations, goals and objectives? ..... 5 4 3 2 1 na
2. To what extent does the learning climate foster individual student satisfaction and self-esteem? ..... 5 4 3 2 1 na
3. To what extent does the learning climate foster individual student achievement? ..... 5 4 3 2 1 na
4. How regularly is the program evaluated in terms of content and students' needs and revised if appropriate? ... 5 4 3 2 1 na
5. To what degree do the following groups have a positive perception of the learning climate:
   a. students? ..... 5 4 3 2 1 na
   b. teachers? ..... 5 4 3 2 1 na
   c. parents and community? ..... 5 4 3 2 1 na
   d. school administration? ..... 5 4 3 2 1 na
   e. district administration? ..... 5 4 3 2 1 na
   f. board of control? ..... 5 4 3 2 1 na

Comments

VIII. EVALUATIONS

Process Evaluation

1. Summarize evidence that organization for instruction, offerings, instructional components (faculty, instructional activities, materials and media, student assessment and program evaluation), facilities and learning climate contribute to the achievement of the major expectations.

2. Summarize evidence that the program has been carried out as designed.

3. Summarize evidence that the methods of evaluation of the program are valid and reliable in terms of data to be gathered.

Product/Outcomes Evaluation

1. Summarize evidence that students are achieving the major expectations of the program.

2. Summarize evidence that the program contributes to the achievement of those goals identified in Section 3, "Philosophy and Goals."

IX. JUDGMENTS AND RECOMMENDATIONS

Strengths

Describe those aspects of the program that are most satisfactory.

Limitations

Describe those aspects of the program that are in most need of improvement.

Recommendations

Describe, in priority order, specific means for correcting the limitations.

Appendix B

University of Alberta
Edmonton
Canada T6G 2G5

Department of Secondary Education
Faculty of Education
341 Education South, Telephone (403) 492-3674
Fax: (403) 492-0236 Email: SE04@MTS.UCS.UALBERTA.CA

July 20, 1992

Dr. Vernon D. Pace,
Executive Director, National Study of School Evaluation,
5201 Leesburg Pike,
Falls Church, Virginia 22041.

Dear Dr. Pace;

At the present time I am enrolled in the Faculty of Graduate Studies and Research of this university where I am completing the requirements for the doctoral degree. The Ministry of Education, Bangkok, Thailand has granted me leave to complete the requirement for the degree. I am employed with the Ministry in the Department of General Education as a supervisor of Industrial Arts.

I have elected as my original research to conduct "An Evaluation of the Industrial Arts Program for Secondary Schools in Thailand". From a review of evaluation criteria that is available I have selected to use Section 4-16, Technology Education (Industrial Arts) as the criteria to use to collect data for my study. These criteria will have to be translated into Thai and back-translated into English.

The purpose of this letter is to ask for your written permission to reproduce Section4-16, Technology Education (Industrial Arts) as the research instrument for my investigation. Your permission will be fully acknowledged.

Thank you for your cooperation.

Sincerely yours,

Paisal Srisarakam

Paisal Srisarakam

Executive Director
VERNON D. PACE
School of Education
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NATIONAL STUDY OF SCHOOL EVALUATION

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National Association of Elementary School Principals
TIMOTHY J. DYER
National Association of Secondary School Principals

August 10, 1992

Paisal Srisarakam
Department of Secondary Education
341 Education South
University of Alberta Edmonton
Canada T6G 2G5

Dear Paisal:

Permission is granted for this one time only to translate into Thai and duplicate section 4-16--Technology Education (Industrial Arts) of the Evaluative Criteria, Sixth Edition, providing that the following conditions are met:

1. The National Study of School Evaluation will hold the copyright to the translated version of section 4-16.
2. You cannot sell or provide the translated section to any other person(s) or institution(s).
3. You provide the National Study of School Evaluation with 4 copies of the translated section to secure the copyright.

If you have any other questions, please call. Good luck with your studies.

Cordially,

Vernon D. Pace

Vernon D. Pace
Executive Director

VDP:rai
cc: James H. Stiltner, Chair
Helen McGraw

University of Alberta
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December 20, 1993

Dr. Vernon D. Pace
Executive Director
National Study of School Evaluation
5201 Leesburg, Falls Church, Virginia
U.S.A.

Dear Dr. Pace:

Thank you for your letter of August 10, 1992 in which permission is granted for me to translate into Thai and duplicate section 4-16 Technology Education (Industrial Arts) of the *Evaluative Criteria*, *Sixth Edition*, providing that the following three conditions are met: the NSSE will hold the copyright to the translated version of section 4-16; the researcher cannot sell or provide the translated section to any other person(s) or institution(s); and 4 copies of the translated section will be provided to the NSSE to secure copyright.

I write this letter to confirm that all the above three conditions set forth by the NSSE will be strictly adhered and that 4 copies of the translated section will be provided to the NSSE as soon as the studies have been completed.

My trip to return to Thailand for 6 months to collect data for the studies delayed my response to your letter. Your permission to use the instrument and your good wish for the studies are very much appreciated.

Yours Truly,

Paisal Srisarakam
Ph.D. candidate
Department of Secondary Education
University of Alberta, Edmonton
Canada T6G 2G5

Appendix C

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Faculty of Education
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มหาวิทยาลัยอัลเบอร์ต้า
ประเทศแคนาดา

วันที่ 18 ตุลาคม พ.ศ. 2535

เรื่อง ขออนุญาตทำการประเมินผล หมวดวิชาอุตสาหกรรมศิลป์ ในโรงเรียนมัธยมศึกษา
เรียน อธิบดีกรมสามัญศึกษา (ผ่าน ผอ. สคศ. และ หศน.)

ตามที่กรมสามัญศึกษาได้อนุมัติให้ข้าพเจ้าไปศึกษาต่อวิชาการบริหารและการมัธยมศึกษา ที่มหาวิทยาลัยอัลเบอร์ต้า ประเทศแคนาดา ตั้งแต่เดือน มิถุนายน 2533 นั้น บัดนี้ข้าพเจ้าได้จบการเรียนภาครายวิชาต่าง ๆ ตามเกณฑ์ของมหาวิทยาลัยกำหนดแล้ว ยังคงเหลือแต่ภาควิทยานิพนธ์ ในหัวข้อ "AN EVALUATION OF INDUSTRIAL ARTS PROGRAM IN SECONDARY SCHOOLS IN THAILAND" ทั้งนี้ เนื่องจากข้าพเจ้าเห็นว่า ยังไม่เคยมีการประเมินผล หมวดวิชาอุตสาหกรรมศิลป์ ในโรงเรียนมัธยมศึกษาที่ครอบคลุมโรงเรียนมัธยมศึกษาทุกขนาดทั่วประเทศมาก่อน

เครื่องมือในการประเมินผลครั้งนี้ ข้าพเจ้าได้ดัดแปลงมาจาก Technology Education (Industrial Arts) Evaluative Criteria, 6th Edition, 1987 จัดพิมพ์โดย National Study of School Evaluation โดยได้รับอนุมัติจาก Executive Director ของหน่วยงานดังกล่าว โดยให้แปลเป็นภาษาไทยและดัดแปลงเพื่อใช้เป็นเครื่องมือในการเก็บข้อมูลประกอบการทำวิทยานิพนธ์นี้

เพื่อให้งานดังกล่าวสำเร็จลุล่วงตามเป้าหมาย และตรงตามกำหนดการที่วางไว้อย่างมีประสิทธิภาพ จึงใคร่ขอความอนุเคราะห์ให้

1.	นางสาวเจริญรัตน์	ไปษกานนท์	ศึกษานิเทศก์ กรมสามัญศึกษา ฝ่ายนิเทศการบริหาร
2.	นางนิยพรรณ	ศรีสารคาม	ผู้อำนวยการโรงเรียนสตรีวัดอัปสรสวรรค์
3.	นายกมล	เวียสุวรรณ	ศึกษานิเทศก์ กรมสามัญศึกษา ฝ่ายนิเทศงานปฏิบัติการสอน ด้านการมัธยมศึกษา
4.	นางนิตยา	เวียสุวรรณ	ศึกษานิเทศก์ กรมสามัญศึกษา ฝ่ายนิเทศงานปฏิบัติการสอน ด้านการมัธยมศึกษา

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เป็นผู้ประสานงานในการทดลองเครื่องมือที่จะใช้ในการประเมินผล และเป็นผู้รวบรวมข้อมูลเพื่อใช้ในการประเมินผลครั้งนี้ และเพื่อความสะดวกรวดเร็วในการรับส่งข้อมูล ข้าพเจ้าจึงขออนุญาตใช้ FAX ของหน่วยศึกษานิเทศก์ในการรับส่งข้อมูล ระหว่างกรมสามัญศึกษากับมหาวิทยาลัยอัลเบอร์ต้า

จึงเรียนมาเพื่อโปรด

1. อนุญาตให้ข้าพเจ้าทำการประเมินผล หมวดวิชาอุตสาหกรรมศิลป์ ในโรงเรียนมัธยมศึกษา
2. อนุญาตให้ทดลองเครื่องมือที่จะใช้ในการเก็บข้อมูลการประเมินผลครั้งนี้
3. อนุญาตให้บุคคลต่อไปนี้เป็นผู้ประสานงานในการประเมินผลครั้งนี้

3.1	นางสาวเจริญรัตน์	โปษกานนท์	ศึกษานิเทศก์ กรมสามัญศึกษา
3.2	นางนิยนวรรณ	ศรีสารคาม	ผู้อำนวยการโรงเรียนสตรีวัดอัปสรสวรรค์
3.3	นายกมล	เวียสุวรรณ	ศึกษานิเทศก์ กรมสามัญศึกษา
3.4	นางนิตยา	เวียสุวรรณ	ศึกษานิเทศก์ กรมสามัญศึกษา

4. อนุญาตให้ใช้ FAX ของหน่วยศึกษานิเทศก์ ในการรับส่งข้อมูลนี้

30 ต.ค. 35
ผู้อำนวยการสศค.

ขอแสดงความนับถือ

(นายไพศาล ศรีสารคาม)
ศึกษานิเทศก์ กรมสามัญศึกษา

เรียน ท่านอธิบดีกรมสามัญศึกษา
ศน ไม่ขัดข้องที่จะให้ ศน. ตามรายชื่อข้างต้นเป็นผู้ประสานงานการประเมินผล

4 ม.ค. 36
(นายประกาศ แสงเพชร)
หัวหน้าหน่วยศึกษานิเทศก์ กรมสามัญศึกษ

1. อนุญาต
2. - 4. อนุญาตด้วย

6 ม.ค. ๒๕๓๖

October 18, 1992.

The Director General,
Department of General Education,
Ministry of Education, Bangkok, Thailand.

Dear Sir:

As you may aware that the Ministry of Education has granted me a leave to study for a doctoral degree in education in the Department of Secondary Education of the Faculty of Education, the University of Alberta, Edmonton, Canada since June, 1990. I have completed all the course work for the degree required by the Faculty of Graduate Studies and Research. The remaining requirement to be fulfilled is to conduct research for the doctoral dissertation. For my research I have selected the topic of "An Evaluation of Industrial Arts Program of selected Secondary Schools in Thailand". The reason I selected this topic is because industrial arts program in the secondary schools of Thailand have never been evaluated from a national perspective.

The instrument to be used to collect data for this study is a modified version of Section 4-16, Technology Education (Industrial Arts) Evaluative Criteria, 6th Edition, 1987. published by the National Study of School Evaluation (NSSE).

I therefore write this letter to ask you to consider granting the following permission:

1. To conduct an evaluation of industrial arts program in the selected secondary schools.
2. To try out the instrument for this study in one secondary school in Bangkok.
3. To appoint the following persons as coordinators for the pilot study:
    - 3.1 Ms. Chareonrat Posaganondh.
    - 3.2 Mrs. Niyapan Srisarakam.
    - 3.3 Mr. Kamol Wearsuwan.
    - 3.4 Mrs. Nitaya Wearsuwan.
4. To use FAX machine to transmit data related to the study.

Your cooperation will be highly appreciated.

Sincerely Yours,
Paisal Srisarakam.

Appendix D

The Thai Translation

of

Section 4-16, Technology Education
(Industrial Arts) Evaluative Criteria,
Sixth Edition, 1987

of

The National Study of School Evaluation
(NSSE)

การประเมินผลหมวดวิชาอุตสาหกรรมศิลป์

ชื่อโรงเรียน ....

วันที่ ....

ประเมินผลโดย คณะกรรมการการประเมินผล ประกอบไปด้วยบุคคลต่อไปนี้

ชื่อ .... ตำแหน่ง ผู้บริหารโรงเรียน

ชื่อ .... ตำแหน่ง หัวหน้าหมวดวิชาอุตสาหกรรมศิลป์

ชื่อ .... ตำแหน่ง ครูอุตสาหกรรมศิลป์

ชื่อ .... ตำแหน่ง ครูอุตสาหกรรมศิลป์

ชื่อ .... นักเรียนแผนการเรียนอุตสาหกรรมศิลป์

ชื่อ .... นักเรียนแผนการเรียนอุตสาหกรรมศิลป์

หมายเหตุ สำหรับโรงเรียนขนาดเล็ก จำนวนของคณะกรรมการประเมินผล อาจมีไม่ถึงจำนวน 6 คน ทั้งนี้เพราะว่า ทั้งโรงเรียนอาจมีครูอุตสาหกรรมศิลป์เพียงคนเดียว ทำหน้าที่ทั้งหัวหน้าหมวดวิชาอุตสาหกรรมศิลป์ และทำหน้าที่สอนวิชาอุตสาหกรรมศิลป์ด้วย

คำชี้แจงการประเมินผล หมวดวิชาอุตสาหกรรมศิลป์

แนวทางการดำเนินการประเมินผล

ในการประเมินผลโรงเรียนใด ๆ ก็ตาม ผู้ประเมินผลควรคำนึงถึงสิ่งสำคัญสอง ประการคือ

1. คุณลักษณะของโรงเรียน และชุมชน
2. ปรัชญา และจุดมุ่งหมายของโรงเรียน

ดังนั้นในการตอบแบบประเมินผลนี้ ท่านควรตั้งคำถามแก่ตัวท่านเองว่า "แนวทางการปฏิบัติของโรงเรียนสอดคล้องกับปรัชญาและจุดมุ่งหมายของโรงเรียนเพียงใด"

ในการตอบแบบประเมินผลนี้ ท่านไม่ควรเอาส่วนประกอบต่าง ๆ ของโรงเรียน เช่น ขนาด, ชนิด, ที่ตั้งของโรงเรียน, งบประมาณสนับสนุน, และระเบียบต่าง ๆ จากกระทรวงศึกษาธิการ ที่โรงเรียนต้องปฏิบัติตาม มาใช้เป็นเกณฑ์ตัดสินว่าโรงเรียนประสบความสำเร็จหรือไม่เพียงใด ในการจัดหาอุปกรณ์ต่าง ๆ มาประกอบการเรียนการสอนวิชาอุตสาหกรรมศิลป์ให้สอดคล้องกับปรัชญาและจุดมุ่งหมายของโรงเรียน

นอกจากนี้สิ่งสำคัญที่ต้องคำนึงถึงในการตอบแบบประเมินผลครั้งนี้คือ ผลการประเมินจะได้นำไปเสนอแนะ เพื่อปรับปรุงการเรียนการสอนวิชาอุตสาหกรรมศิลป์ เพื่อให้มีคุณภาพดียิ่งขึ้นต่อไป

ดังนั้นเพื่อให้การประเมินผลครั้งนี้ บรรลุจุดมุ่งหมายดังกล่าว โปรดใช้วิจารณญาณของท่าน ตัดสินอย่างรอบคอบ ในการตอบแบบประเมินผลครั้งนี้ด้วย

เกณฑ์การพิจารณาในการให้คะแนน

คะแนน	เกณฑ์พิจารณา
5	ดีเยี่ยม
4	ดี
3	พอใช้ (แต่ยังจะปรับปรุงได้อีกบ้าง)
2	ยังไม่พอใช้ (ควรได้รับการปรับปรุงโดยด่วน)
1	ยังไม่มี แต่มีความต้องการ
ม	ไม่จำเป็น, ไม่เหมาะสม, ไม่ตรงกับความต้องการ

แนวทางในการพิจารณาตัดสินให้คะแนน

ในการพิจารณาตัดสินให้คะแนน ท่านควรคำนึงถึงว่าอุปกรณ์ประกอบการเรียนการสอน มีความเพียงพอหรือไม่ และอุปกรณ์เหล่านั้นได้ถูกใช้งานมากน้อยแค่ไหนด้วย

ตัวอย่างที่ 1 ถ้าห้องเรียนมีอุปกรณ์ประกอบการเรียนการสอนดีเยี่ยม แต่อุปกรณ์เหล่านั้นได้ถูกนำมาใช้งานอย่างไม่เพียงพอ ในกรณีเช่นนี้ ท่านควรพิจารณาตัดสินให้คะแนนเกณฑ์ที่ต่ำกว่า 5 หรือต่ำกว่า ดีเยี่ยม ทั้งนี้เพราะว่าแม้ห้องเรียนจะมีอุปกรณ์ดีเยี่ยมก็ตาม แต่การนำอุปกรณ์เหล่านั้นมาใช้งานยังไม่เต็มที่ คือเป็นไปอย่างจำกัด ดังนั้นจึงควรได้รับการพิจารณา ให้คะแนนในระดับที่ต่ำกว่า 5 หรือดีเยี่ยม

ตัวอย่างที่ 2 ในการพิจารณาตัดสินให้คะแนนในการตอบแบบประเมินผล คำถามที่ว่า "ห้องเรียน มีอุปกรณ์ การสาธิต เพียงพอหรือไม่ เพียงใด?"

- ถ้าท่านเห็นว่า ห้องเรียนมีอุปกรณ์สำหรับใช้ในการสาธิตอย่างสมบูรณ์ ดีเยี่ยมที่สุด เท่าที่ท่านเคยพบมา วงรอบหมายเลข "5"
- ถ้าท่านเห็นว่า อุปกรณ์สำหรับการสาธิตดี แต่ยังไม่ดีที่สุด วงรอบหมายเลข "4"
- ถ้าท่านเห็นว่า อุปกรณ์สำหรับการสาธิตเป็นที่พอใจ วงรอบหมายเลข "3"
- ถ้าห้องเรียนไม่มีอุปกรณ์สำหรับการสาธิต แต่จำเป็นต้องมี วงรอบหมายเลข "2"
- ถ้าอุปกรณ์สาธิต ไม่จำเป็นต้องมี วงรอบ "ม"

ข้อเสนอแนะ

ข้อเสนอแนะของท่านจะได้รับการพิจารณา เพื่อนำไปสรุป เป็นข้อเสนอแนะสำหรับการปรับปรุง คุณภาพการเรียนการสอน วิชาอุตสาหกรรมศิลป์ ต่อไป

ถ้าท่านมีข้อเสนอแนะใด ๆ โปรดกรอกลงในภายใต้หัวข้อ "ข้อเสนอแนะ" ในแบบการประเมินผลแต่ละตอน ข้อเสนอแนะของท่านอาจเป็นการให้ข้อมูลเพิ่มเติม นอกเหนือไปจากคำถามที่มีในแบบการประเมินผลในแต่ละตอนที่คำถามครอบคลุมไปไม่ถึงก็ได้

แบบการประเมินผล แบ่งออกเป็น 7 ตอน คือ

1. จุดมุ่งหมายหลัก
2. การจัดการเรียนการสอน
3. รายวิชาที่เปิดสอน
4. องค์ประกอบของการจัดการเรียนการสอน
5. เครื่องมือและอุปกรณ์
6. บรรยากาศของการเรียนการสอน
7. สรุปการประเมินผลและข้อเสนอแนะ

1 จุดมุ่งหมายหลัก

จุดมุ่งหมายหลัก ควรจะสอดคล้องกับความต้องการของชุมชนและจุดมุ่งหมายหลักของโรงเรียน จุดมุ่งหมายหลักใช้เป็นแนวทางในการจัดโปรแกรมการเรียนการสอน ตลอดจนการจัดกิจกรรมการเรียนการสอน

จุดมุ่งหมายหลักของการเรียนการสอนวิชาอุตสาหกรรมศิลป์ ควรจะมีลักษณะดังต่อไปนี้

- มีการนำเอาหลักวิชาวิทยาศาสตร์ และคณิตศาสตร์เบื้องต้นมาประยุกต์ใช้ในการเรียนการสอน ในหมวดวิชาอุตสาหกรรมศิลป์
- นักเรียนได้มีโอกาสตัดสินใจเลือกอาชีพทางเทคโนโลยีเพื่อศึกษาต่อในระดับอุดมศึกษา หรือมีโอกาสเลือกอาชีพทางวิศวกรรมศาสตร์ หรืออาชีพบริการที่เกี่ยวข้องกับเทคโนโลยี
- นักเรียนได้ตัดสินใจเลือกเรียนเกี่ยวกับวิชาชีพในสถาบันทางอาชีวชั้นสูง
- นักเรียนได้รับความเข้าใจ และมีความซาบซึ้งอย่างลึกซึ้งในเทคโนโลยีในสังคมปัจจุบัน
- นักเรียนได้รับการพัฒนา ทักษะพื้นฐาน ในการใช้เครื่องมือ, เครื่องจักร, วัสดุ และกระบวนการอย่างเหมาะสม
- นักเรียนได้เรียนรู้เกี่ยวกับการแก้ปัญหาเกี่ยวข้องกับการใช้เครื่องมือ, เครื่องจักร วัสดุ, กระบวนการ, ผลิตภัณฑ์ทางอุตสาหกรรม และบริการทางอุตสาหกรรมและเทคโนโลยี

I จุดมุ่งหมายหลัก (ต่อ)

1. โปรดชี้ให้เห็นว่าจุดมุ่งหมายหลักของหมวดวิชาอุตสาหกรรมศิลป์ มีความสอดคล้องกันกับสิ่งต่าง ๆ ดังต่อไปนี้มากน้อยเพียงใด

ก. คุณลักษณะของโรงเรียนและชุมชน..............................

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ข. ปรัชญาและจุดมุ่งหมายรวมของโปรแกรมการเรียนการสอน...............

....

....

2. โปรดชี้ให้เห็นว่าโรงเรียน ได้จัดดำเนินการเรียนการสอนวิชาอุตสาหกรรมศิลป์เพื่อให้บรรลุจุดมุ่งหมายหลัก หรือเป้าหมายที่วางไว้แค่ไหนเพียงใด

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....

....

3. โปรดชี้ให้เห็นว่าจุดมุ่งหมายหลักของหมวดวิชาอุตสาหกรรมศิลป์ มีความเหมาะสมกับความต้องการ และความสนใจของนักเรียนมากน้อยเพียงใด

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....

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4. โปรดระบุปัญหาอุปสรรคที่มีผลต่อการจัดการเรียนการสอนวิชาอุตสาหกรรมศิลป์ บรรลุเป้าหมายที่วางไว้

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II การจัดการเรียนการสอน

1. หลักสูตรปัจจุบันได้ชี้ให้เห็น หลักการ เหตุผล ที่รวมเอาวิชาอุตสาหกรรมศิลป์ ไว้เป็นส่วนหนึ่งของหลักสูตร โรงเรียนมัธยมศึกษา 5 4 3 2 1 ม

2. ปรัชญา, จุดมุ่งหมาย ของวิชาอุตสาหกรรมศิลป์ ได้ถูกกำหนดขึ้นมาด้วยความร่วมมือกัน ระหว่างผู้บริหารโรงเรียน, ครูผู้สอน นักเรียน, ผู้ปกครอง และตัวแทนจากธุรกิจและอุตสาหกรรม 5 4 3 2 1 ม

3. ปรัชญา, จุดมุ่งหมาย ของวิชาอุตสาหกรรมศิลป์ มีความสอดคล้องกับความต้องการของท้องถิ่น และของประเทศโดยส่วนรวม 5 4 3 2 1 ม

4. แผนการเรียนการสอน, การดำเนินการสอน, และการประเมินผล ต่างสอดคล้องกับปรัชญาและจุดมุ่งหมาย ของวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

5. ปรัชญา, จุดมุ่งหมาย ของวิชาอุตสาหกรรมศิลป์ ได้รับการทบทวนเป็นครั้งคราว เมื่อมีความจำเป็น 5 4 3 2 1 ม

6. รายวิชาที่เปิดสอน ในหมวดวิชาอุตสาหกรรมศิลป์ ซึ่งเกี่ยวข้องกับการสื่อสาร คมนาคม, การก่อสร้าง, การผลิต, และการขนส่ง มีความสอดคล้องกับจุดประสงค์ของวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

7. โรงเรียนได้จัดให้มีจำนวนชั่วโมงเรียนเพียงพอในวิชาอุตสาหกรรมศิลป์ เพื่อให้บรรลุจุดมุ่งหมายของรายวิชา 5 4 3 2 1 ม

8. นักเรียนทุกคนไม่เลือกเพศต่างก็มีโอกาสได้เลือกเรียนวิชาอุตสาหกรรมศิลป์ อย่างทัดเทียมกันทุกคน 5 4 3 2 1 ม

II การจัดการเรียนการสอน (ต่อ)

9. โปรแกรมการเรียนวิชาอุตสาหกรรมศิลป์ ได้รับการปรับปรุงให้ทันสมัยอยู่เสมอ เพื่อเป็นการสนองความต้องการและความสนใจของนักเรียนทุกคน 5 4 3 2 1 ม

10. โรงเรียนมีงบประมาณเพียงพอ สำหรับสนับสนุนให้การเรียนการสอน วิชาอุตสาหกรรมศิลป์ บรรลุเป้าหมายของรายวิชาตามความเหมาะสมต่อจำนวนนักเรียน และความต้องการของนักเรียน 5 4 3 2 1 ม

11. โรงเรียนได้จัดให้มีบริการสนับสนุนการเรียนการสอนวิชาอุตสาหกรรมศิลป์ อย่างเพียงพอ เช่น จัดให้บริการแนะแนว, บริการงานธุรการ, และการปรับซ่อม, บำรุงรักษาเครื่องจักร เครื่องมือ 5 4 3 2 1 ม

12. ครูผู้สอน ได้ขอความร่วมมือจากบุคลากรในท้องถิ่น เป็นครั้งคราว เพื่อช่วยให้การเรียนการสอนบรรลุจุดมุ่งหมายของวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

13. โรงเรียนได้จัดตั้งคณะกรรมการที่ปรึกษา และโรงเรียนได้ใช้บริการของคณะกรรมการที่ปรึกษา เพื่อให้การสนับสนุนการเรียนการสอนให้บรรลุเป้าหมายที่ตั้งไว้ 5 4 3 2 1 ม

14. ชุมชน คณะกรรมการศึกษาของท้องถิ่น, ธุรกิจ, อุตสาหกรรม และรัฐบาล ต่างได้รับทราบถึงการจัดการเรียนการสอน และต่างก็มีโอกาสที่จะมีส่วนร่วม ในการจัดการเรียนการสอนวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

การประเมินผลการจัดการเรียนการสอน

1. โรงเรียนได้นำเอาปรัชญา, จุดมุ่งหมาย, และจุดประสงค์ของวิชาอุตสาหกรรมศิลป์ มาใช้เป็นหลักในการจัดการเรียนการสอนหรือไม่เพียงใด 5 4 3 2 1 ม

2. นักเรียนทุกคนสามารถเลือกเรียนรายวิชาต่าง ๆ ที่โรงเรียนเปิดสอนได้อย่างเสรีเพียงใด 5 4 3 2 1 ม

3. จำนวนชั่วโมงเรียนต่อรายวิชา, การจัดตารางสอน, และการจัดจำนวนนักเรียนต่อชั้นเรียน มีความเหมาะสม มากน้อยเพียงใด 5 4 3 2 1 ม

4. งบประมาณสนับสนุนการจัดการเรียนการสอนวิชาอุตสาหกรรมศิลป์ มีความเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

5. การประสานแผนสำหรับการเรียนการสอนวิชาอุตสาหกรรมศิลป์ มีความเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

6. ทรัพยากรสนับสนุนการเรียนการสอน ของวิชาอุตสาหกรรมศิลป์ ทั้งที่มีอยู่ในโรงเรียนและนอกโรงเรียน ได้ถูกนำมาใช้อย่างเพียงพอหรือไม่เพียงใด 5 4 3 2 1 ม

7. นักเรียน, ผู้ปกครอง และชุมชน ต่างก็ได้รับทราบถึงข้อมูลข่าวสารที่เกี่ยวกับโปรแกรมการเรียนการสอน วิชาอุตสาหกรรมศิลป์ มาก 5 4 3 2 1 ม

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III รายวิชาที่เปิดสอน

โปรแกรมการเรียนการสอนวิชาอุตสาหกรรมศิลป์ในทุกระดับควรจะประกอบไปด้วยสิ่งเหล่านี้

1. ความรู้ ความเข้าใจเกี่ยวกับเทคโนโลยีรวมทั้งกระบวนการ
และระบบของเทคโนโลยี 5 4 3 2 1 ม

2. ความรู้เกี่ยวกับพัฒนาการของเทคโนโลยีและผลกระทบต่อมนุษย์
สิ่งแวดล้อมและวัฒนธรรม 5 4 3 2 1 ม

3. เนื้อหาวิชาอุตสาหกรรมศิลป์ ได้นำเอามาจากแขนงวิชาต่าง ๆ
เหล่านี้อย่างน้อยหนึ่งแขนงวิชาคือ การสื่อสาร, การก่อสร้าง,
การผลิต และการขนส่ง 5 4 3 2 1 ม

4. ช่วยให้นักเรียนพัฒนาความรู้ ความเข้าใจ และความซาบซึ้ง
เกี่ยวกับเทคโนโลยี รวมทั้งกระบวนการและระบบของ
เทคโนโลยี 5 4 3 2 1 ม

5. ช่วยให้นักเรียนสามารถนำเครื่องมือ, วัสดุ, เครื่องจักร,
กระบวนการและความรู้ความเข้าใจในเทคโนโลยีไปใช้งาน
ได้อย่างมีประสิทธิภาพและปลอดภัย 5 4 3 2 1 ม

6. ช่วยให้นักเรียนพัฒนาความสามารถในการแก้ปัญหา และการ
ตัดสินใจเกี่ยวข้องกับมนุษย์, แหล่งทรัพยากร, กระบวนการ,
และระบบเทคโนโลยีได้อย่างมีประสิทธิภาพ 5 4 3 2 1 ม

7. ช่วยให้นักเรียนพัฒนาทักษะ, ความคิดริเริ่มสร้างสรรค์,
ความรู้ความเข้าใจอย่างถูกต้องเกี่ยวกับเทคโนโลยี 5 4 3 2 1 ม

III รายวิชาที่เปิดสอน (ต่อ)

8. กิจกรรมที่ใช้สอนในห้องเรียน เป็นกิจกรรมที่ส่งเสริมให้นักเรียนสามารถนำเอาทฤษฎีที่เป็นนามธรรมมาปฏิบัติเป็นรูปธรรมขึ้นมาได้ 5 4 3 2 1 ม

9. ช่วยเตรียมนักเรียนเพื่อให้อยู่ในสังคมที่เกี่ยวข้องกับเทคโนโลยี ซึ่งจะต้องเป็นคนที่สนใจใฝ่เรียนไปตลอดชั่วชีวิต 5 4 3 2 1 ม

10. การเรียนการสอนวิชาอุตสาหกรรมศิลป์ได้เน้นบูรณาการในระหว่าง "การเรียนรู้" และ "การลงมือปฏิบัติได้" 5 4 3 2 1 ม

การประเมินผลรายวิชาอุตสาหกรรมศิลป์ที่เปิดสอน

1. ความรู้ความเข้าใจและประสบการณ์ที่นักเรียนได้รับจากการเรียน
   วิชาอุตสาหกรรมศิลป์มีความสัมพันธ์กับเทคโนโลยีแค่ไหน เพียงใด 5 4 3 2 1 ม

2. ขอบข่าย และขั้นตอนของเนื้อหาวิชาในบทเรียนมีความสัมพันธ์กับ
   ความสนใจ, ความสามารถ, และพัฒนาการของนักเรียนมากน้อย
   เพียงใด 5 4 3 2 1 ม

3. รายวิชาที่เปิดสอน ในหมวดวิชาอุตสาหกรรมศิลป์ ส่งเสริม
   ความคิดริเริ่มสร้างสรรค์ และประสบการณ์ในการแก้ปัญหา
   ของนักเรียนเกี่ยวกับเครื่องมือ, วัสดุ และความเข้าใจ
   เกี่ยวกับเทคโนโลยีหรือไม่เพียงใด 5 4 3 2 1 ม

4. นักเรียนได้พัฒนาความรู้พื้นฐานเกี่ยวกับพัฒนาการ ของ
   เทคโนโลยีและผลกระทบของมันต่อมนุษย์, สิ่งแวดล้อม
   วัฒนธรรมมากน้อยเพียงใด 5 4 3 2 1 ม

5. นักเรียนได้พัฒนา ความรับผิดชอบ และความเป็นผู้นำ
   หรือไม่เพียงใด 5 4 3 2 1 ม

6. โปรแกรมการเรียนวิชาอุตสาหกรรมศิลป์ มีความยืดหยุ่น
   เพื่อเป็นการสนองความต้องการของนักเรียนแต่ละคน
   มากน้อยเพียงใด 5 4 3 2 1 ม

7. นักเรียนได้แสดงออกให้ประจักษ์ชัดถึงนิสัยในการทำงาน
   ด้วยความปลอดภัย มากน้อยเพียงใด 5 4 3 2 1 ม

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IV องค์ประกอบของการจัดการเรียนการสอน

ก. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ ควรมีคุณสมบัติดังนี้

1. มีคุณวุฒิทางการศึกษา และมีทักษะทางวิชาชีพครบตามเกณฑ์ของกระทรวงศึกษาธิการ 5 4 3 2 1 ม

2. มีความสามารถในการวางแผน, จัดการ, ดำเนินการสอน, ประเมินผล, และจัดกิจกรรมการเรียนการสอนในวิชาอุตสาหกรรมศิลป์ได้อย่างมีประสิทธิภาพ 5 4 3 2 1 ม

3. มีพื้นฐานการศึกษา และเคยได้รับการฝึกอบรมอย่างกว้างขวางในแขนงวิชาที่เกี่ยวกับการสื่อสารและโทรคมนาคม, การผลิต และการขนส่ง 5 4 3 2 1 ม

4. มีทักษะในแขนงวิชาที่ทำการสอนอย่างเพียงพอ 5 4 3 2 1 ม

5. มีความรู้ความเข้าใจเกี่ยวกับกฎหมาย ระเบียบ ข้อบังคับ และความรับผิดชอบเกี่ยวกับการใช้โรงฝึกงาน อย่างเพียงพอ 5 4 3 2 1 ม

6. มีแผนการณ์ที่จะพัฒนาทักษะในวิชาชีพ เพื่อเพิ่มพูนและดำรงไว้ซึ่งสมรรถนะในการสอนวิชาชีพ 5 4 3 2 1 ม

7. สามารถวางแผนจัดการเรียนการสอน โดยการทำงานร่วมกับครูแนะแนว และบุคลากรที่สนับสนุนการสอนอื่น ๆ 5 4 3 2 1 ม

8. มีความรู้ความเข้าใจ เกี่ยวกับเทคโนโลยีอย่างเป็นปัจจุบันทันสมัย โดยอาศัยการอ่านในวารสารทางวิชาชีพและเทคโนโลยีอยู่เป็นประจำ 5 4 3 2 1 ม

IV องค์ประกอบของการจัดการเรียนการสอน (ต่อ)

9. ยึดถือและปฏิบัติตามจรรยาบรรณของครู เกี่ยวกับความประพฤติ
และความรับผิดชอบในการสอน 5 4 3 2 1 ม

10. มีความสามารถในการเขียนและการพูดเหมาะสมกับความรับผิดชอบ
ในฐานะครูผู้สอนวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

ข้อมูลเพิ่มเติม

1. โปรดระบุจำนวนครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ที่สำเร็จการศึกษาในระดับต่าง ๆ ดังต่อไปนี้ (ไม่นับบุคคลคนเดียวกัน ซ้ำมากกว่า 1 ครั้ง)

ก. ระดับการศึกษา ต่ำกว่าปริญญาตรี .... คน
ปริญญาตรี .... คน
ปริญญาโท .... คน
สูงกว่าปริญญาโท .... คน
ปริญญาเอก .... คน

ข. คุณวุฒิทางวิชาชีพของครูในหมวดวิชาอุตสาหกรรมศิลป์
ระดับประกาศนียบัตร .... คน
ต่ำกว่าระดับประกาศนียบัตร .... คน

ค. จำนวนปีที่ครูในหมวดวิชาอุตสาหกรรมศิลป์ ได้สอนวิชาอุตสาหกรรมศิลป์
ไม่เกิน 2 ปี .... คน
3 - 5 ปี .... คน
6 - 15 ปี .... คน
มากกว่า 15 ปี .... คน

2. โปรดระบุจำนวนครูในหมวดวิชาอุตสาหกรรมศิลป์ที่เกี่ยวข้อง และมีส่วนร่วมในกิจกรรมเพื่อพัฒนาบุคลากรในระยะเวลา 3 ปี ที่ผ่านมา

การฝึกอบรมที่โรงเรียนจัด .... คน
การฝึกอบรมในภาคฤดูร้อน .... คน
การศึกษาต่อในภาคค่ำ .... คน
การลาศึกษาต่อ .... คน
ร่วมกิจกรรมอื่น ๆ ที่เกี่ยวข้องกับการพัฒนาบุคลากร .... คน

การประเมินผลองค์ประกอบของการเรียนการสอน

1. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ มีพื้นความรู้ ความสามารถในแขนงวิชาที่สอนเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

2. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ ได้รับข้อมูลข่าวสารที่ทันสมัยเกี่ยวกับพัฒนาการใหม่ ๆ ในแขนงวิชาอื่นที่ทำการสอนแค่ไหน เพียงใด 5 4 3 2 1 ม

3. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ ได้แสดงให้เห็นถึงความตั้งใจที่จะพัฒนาตนเอง ในทางวิชาชีพให้ก้าวหน้าอยู่เสมอหรือไม่ เพียงใด 5 4 3 2 1 ม

4. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ทุกคน มีความรู้ความเข้าใจที่ชัดเจนต่อวิชาอุตสาหกรรมศิลป์แค่ไหน เพียงใด 5 4 3 2 1 ม

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ข. กิจกรรมการเรียนการสอน

1. แผนการเรียนของครูสำหรับวิชาอุตสาหกรรมศิลป์ มุ่งส่งเสริมให้นักเรียนได้พัฒนาความสามารถที่สอดคล้องกับจุดประสงค์ของรายวิชานั้น ๆ 5 4 3 2 1 ม

2. แผนการสอนของครูและบันทึกการสอนสำหรับแต่ละบทเรียนมีความสอดคล้องกับจุดมุ่งหมายของรายวิชาและความต้องการของนักเรียน 5 4 3 2 1 ม

3. ครูในหมวดวิชาอุตสาหกรรมศิลป์ได้คิดประดิษฐ์ หรือจัดหาสื่อการสอนที่ทันสมัย และมีความเหมาะสมกับบทเรียน 5 4 3 2 1 ม

4. ครูในหมวดวิชาอุตสาหกรรมศิลป์ ยินดี และเต็มใจที่จะรับการประเมินผลสัมฤทธิ์ในการสอน 5 4 3 2 1 ม

5. ครูในหมวดวิชาอุตสาหกรรมศิลป์ได้ใช้วิธีสอนต่าง ๆ กันหลายวิธีตามความเหมาะสมกับบทเรียน เพื่อช่วยให้นักเรียนบรรลุจุดประสงค์ของบทเรียน 5 4 3 2 1 ม

6. นักเรียนได้มีการพัฒนาความรู้ความเข้าใจ เกี่ยวกับสังคมที่เกี่ยวข้องกับเทคโนโลยีอันเป็นผลเนื่องมาจากการได้เรียนรู้จากกิจกรรมการเรียนการสอนวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

7. วิชาอุตสาหกรรมศิลป์มุ่งเน้นให้นักเรียนได้พัฒนาความสามารถที่จะเลือกอาชีพได้อย่างถูกต้องและเหมาะสมแก่ตัวนักเรียนเอง 5 4 3 2 1 ม

ข. กิจกรรมการเรียนการสอน (ต่อ)

8. วิชาอุตสาหกรรมศิลป์มีจุดมุ่งหมายที่จะเตรียมตัวนักเรียนสำหรับการเรียนต่อในระดับอุดมศึกษา, ระดับอาชีวะศึกษา, เทคนิคชั้นสูง และยังช่วยให้นักเรียนมีทักษะในวิชาอื่นที่เป็นสากล ซึ่งสามารถโอนถ่ายไปใช้ในแขนงวิชาอื่นได้ด้วย 5 4 3 2 1 ม

9. วิชาอุตสาหกรรมศิลป์ มุ่งเน้นให้นักเรียนเตรียมตัวเพื่อให้เกิดการเรียนรู้ไปตลอดชีวิตในสังคมที่เกี่ยวข้องกับเทคโนโลยี 5 4 3 2 1 ม

10. กิจกรรมการเรียนการสอนในวิชาอุตสาหกรรมศิลป์ ได้ช่วยให้นักเรียนพัฒนาทักษะในวิชาชีพ และมีทัศนคติที่ดีต่อวิชาชีพ 5 4 3 2 1 ม

11. กิจกรรมการเรียนการสอนในวิชาอุตสาหกรรมศิลป์ได้ช่วยให้นักเรียนสามารถใช้เครื่องมือ, วัสดุ, กระบวนการ, เครื่องจักร ได้อย่างถูกต้อง และยังช่วยพัฒนาความรู้ความเข้าใจเกี่ยวกับการปฏิบัติงานอย่างมีประสิทธิภาพและปลอดภัย 5 4 3 2 1 ม

12. กิจกรรมการเรียนการสอนในวิชาอุตสาหกรรมศิลป์ ได้ช่วยส่งเสริมให้นักเรียนพัฒนาทักษะที่เกี่ยวข้องกับกระบวนการ เช่น ความคิดสร้างสรรค์ การใช้วิจารณญาณ, การตัดสินใจ, และการแก้ปัญหาเฉพาะหน้า 5 4 3 2 1 ม

13. ครูในหมวดวิชาอุตสาหกรรมศิลป์ได้ใช้วิธีสอน ทั้งแบบนักเรียนเป็นศูนย์กลางการเรียน และแบบครูเป็นศูนย์กลางการสอน 5 4 3 2 1 ม

14. โปรแกรมการเรียนการสอนวิชาอุตสาหกรรมศิลป์ ได้เปิดโอกาสให้นักเรียนได้สัมผัสกับรายวิชาต่าง ๆ อย่างหลากหลาย 5 4 3 2 1 ม

15. ครูในหมวดวิชาอุตสาหกรรมศิลป์ ได้ใช้วิธีสอน ทั้งแบบเป็นราย
บุคคล และแบบกลุ่ม หรือไม่ 5 4 3 2 1 ม

16. ครูในหมวดวิชาอุตสาหกรรมศิลป์ ได้ใช้กิจกรรมการเรียนการสอน
อย่างหลากหลาย ทั้งกิจกรรมในหลักสูตร และกิจกรรมเสริม
หลักสูตร เพื่อเสริมสร้างทักษะในการเป็นผู้นำแก่นักเรียน 5 4 3 2 1 ม

17. ทรัพยากรที่มีในชุมชน ได้ถูกนำมาใช้สนับสนุนการเรียนการสอน
ในโอกาสที่เหมาะสม 5 4 3 2 1 ม

18. นักเรียนได้ใช้ทรัพยากรทั้งในและนอกโรงเรียนเพื่อประกอบ
การเรียนวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

การประเมินผลกิจกรรมการเรียนการสอน

1. กิจกรรมการเรียนการสอน ในหมวดวิชาอุตสาหกรรมศิลป์มีความสัมพันธ์กับความต้องการของนักเรียนและจุดมุ่งหมายของรายวิชามากน้อยเพียงใด 5 4 3 2 1 ม

2. การวางแผน และการเตรียมการสอนในหมวดวิชาอุตสาหกรรมศิลป์ มีประสิทธิภาพ เพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

3. โรงเรียนได้นำเอาทรัพยากรที่มีอยู่ในชุมชน มาผนวกไว้ในโปรแกรมการเรียนการสอน วิชาอุตสาหกรรมศิลป์หรือไม่ เพียงใด 5 4 3 2 1 ม

4. ครูในหมวดวิชาอุตสาหกรรมศิลป์ได้มีการร่วมงานกับครูในหมวดวิชาอื่น เพื่อจัดการเรียนการสอน ให้มีคุณภาพดียิ่งขึ้นหรือไม่ เพียงใด 5 4 3 2 1 ม

ข้อเสนอแนะ

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ค. วัสดุอุปกรณ์ และสื่อการสอน

1.. โรงเรียนได้จัดหาเอกสาร ตำราเรียน ให้นักเรียนได้อ่านอย่างสมบูรณ์ครบถ้วน ทุกแขนงวิชา 5 4 3 2 1 ม

2. โรงเรียนได้จัดหาวัสดุ อุปกรณ์ ประกอบการเรียนการสอนไว้อย่างหลากหลายและเหมาะสมกับความสามารถของนักเรียนแต่ละคน 5 4 3 2 1 ม

3. ครูผู้สอนในหมวดวิชาอุตสาหกรรมศิลป์ ได้จัดหาและใช้อุปกรณ์วัสดุประกอบการสอน อย่างหลากหลาย 5 4 3 2 1 ม

4. ในหมวดวิชาอุตสาหกรรมศิลป์มีแหล่งวัสดุ อุปกรณ์ คู่มือนักเรียนและวัสดุสนับสนุนการเรียนการสอนอย่างครบถ้วน และได้ใช้สิ่งดังกล่าวอย่างเพียงพอ 5 4 3 2 1 ม

5. ในหมวดวิชาอุตสาหกรรมศิลป์ มีวัสดุ อุปกรณ์ ประกอบการเรียนการสอนอย่างเพียงพอ ที่จะช่วยให้การเรียนการสอนบรรลุเป้าหมาย ของหลักสูตรและโปรแกรมการเรียน 5 4 3 2 1 ม

6. วัสดุ อุปกรณ์ ประกอบการเรียนการสอนที่ครูใช้สอนในหมวดวิชาอุตสาหกรรมศิลป์ช่วยส่งเสริมให้นักเรียน ได้รับประสบการณ์ในวิชาชีพ 5 4 3 2 1 ม

7. โรงเรียนและครูต่างเคารพและปฏิบัติตามกฎหมายว่าด้วยลิขสิทธิ์ในการใช้และลอกเลียนวัสดุ อุปกรณ์ ที่มีกฎหมายลิขสิทธิ์คุ้มครอง 5 4 3 2 1 ม

8. โรงเรียนได้จัดทำแนวปฏิบัติสำหรับใช้เป็นแนวทางในการเลือกวัสดุ อุปกรณ์ ประกอบการเรียนการสอน ให้เป็นไปอย่างมีประสิทธิภาพ 5 4 3 2 1 ม

ท. วัสดุอุปกรณ์ และสื่อการสอน (ต่อ)

9. คณะครูในหมวดวิชาอุตสาหกรรม ต่างยึดแนวปฏิบัติร่วมกัน
ในการตัดสินใจเลือกวัสดุอุปกรณ์ ประกอบการเรียนการสอน 5 4 3 2 1 ม

10. ครูในหมวดวิชาอุตสาหกรรมศิลป์ ได้ปรึกษาหารือกับเจ้าหน้าที่
โสตทัศนอุปกรณ์เป็นประจำเกี่ยวกับการจัดหา, การใช้วัสดุ
อุปกรณ์ และการใช้บริการ 5 4 3 2 1 ม

11. ครูในหมวดวิชาอุตสาหกรรมศิลป์ สามารถหยิบยืม วารสาร
ทางวิชาชีพที่เป็นปัจจุบันได้จากแหล่งต่าง ๆ เป็นประจำ 5 4 3 2 1 ม

12. โปรดกาเครื่องหมาย / ลงหน้า รายการวัสดุอุปกรณ์ประกอบการเรียนการสอน ที่ครูในหมวดวิชานี้ ใช้ประกอบการเรียนการสอนเป็นประจำ

.... หนังสือ ตำรา
.... การสาธิต
.... แผนภูมิ
.... [✓ แผ่นใส]
.... สไลด์
.... โปสเตอร์
.... อื่น ๆ โปรดระบุ

13. ทั้งนักเรียนและครูในหมวดวิชาอุตสาหกรรมศิลป์ ได้ใช้วัสดุอุปกรณ์
ประกอบการเรียนการสอนที่มีอยู่ 5 4 3 2 1 ม

14. โรงเรียนได้จัดหาวัสดุอุปกรณ์เกี่ยวกับการแนะแนวอาชีพสำหรับ
นักเรียนไว้ให้นักเรียนได้ใช้ 5 4 3 2 1 ม

15. วิธีการที่โรงเรียนใช้ในการสั่งซื้อของ, การทำรายการ, การ
ทำบัญชีวัสดุครุภัณฑ์ มีความเหมาะสม 5 4 3 2 1 ม

ค. วัสดุอุปกรณ์ และสื่อการสอน (ต่อ)

16. โรงเรียนมีงบประมาณประจำปี ในการจัดซื้อวัสดุสิ้นเปลืองอย่าง
พอเพียงกับการใช้งาน 5 4 3 2 1 ม

17. โรงเรียนมีห้องเก็บของเพื่อใช้เก็บวัสดุ อุปกรณ์ และสื่อการสอน
อย่างเพียงพอ 5 4 3 2 1 ม

การประเมินผลวัสดุ อุปกรณ์ และสื่อการสอน

1. โรงเรียนได้จัดหาวัสดุอุปกรณ์ ประกอบการเรียนการสอนไว้มีจำนวน
มากพอกับความต้องการ หรือไม่ เพียงใด 5 4 3 2 1 ม

2. โรงเรียนได้จัดหาวัสดุอุปกรณ์ประกอบการเรียนการสอนที่มีคุณภาพ
ดีพอกับการใช้งานหรือไม่ เพียงใด 5 4 3 2 1 ม

3. โรงเรียนได้จัดหาวัสดุอุปกรณ์ ประกอบการเรียนการสอนให้มี
ปริมาณเพียงพอกับความต้องการหรือไม่ เพียงใด 5 4 3 2 1 ม

4. ทั้งนักเรียนและครูในหมวดวิชานี้ สามารถใช้วัสดุอุปกรณ์ประกอบ
การเรียนการสอนได้อย่างเสรีหรือไม่ เพียงใด 5 4 3 2 1 ม

5. วัสดุอุปกรณ์ประกอบการเรียนการสอน ได้รับการดูแล บำรุงรักษา
ให้อยู่ในสภาพดีพอที่จะใช้งานได้หรือไม่ เพียงใด 5 4 3 2 1 ม

6. ครูและนักเรียนในหมวดวิชานี้ได้นำเอาวัสดุ อุปกรณ์ที่มีอยู่มาใช้
อย่างคุ้มค่าแค่ไหน เพียงใด 5 4 3 2 1 ม

7. โรงเรียนได้จัดห้องเก็บวัสดุ อุปกรณ์การสอนไว้ให้เพียงพอกับ
การใช้งานหรือไม่เพียงใด 5 4 3 2 1 ม

ข้อเสนอแนะ

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ง. การประเมินผลสัมฤทธิ์ของนักเรียน และโปรแกรมการเรียน

1. โรงเรียนถือว่าการประเมินผลสัมฤทธิ์ของนักเรียน เป็นส่วนสำคัญ
ที่จะขาดเสียไม่ได้ของการสอน 5 4 3 2 1 ม

2. โรงเรียนได้ใช้วิธีการประเมินผล โดยคำนึงถึงความแตกต่าง
ระหว่างบุคคล ของนักเรียน 5 4 3 2 1 ม

3. โรงเรียนได้รายงานผลการประเมิน ให้เจ้าตัวนักเรียน, ครู
ผู้ปกครองทราบ 5 4 3 2 1 ม

4. โรงเรียนได้ใช้ผลที่ได้รับจากการประเมินนักเรียน เพื่อให้เกิด
ประโยชน์ในเรื่องต่อไปนี้ หรือไม่ เพียงใด
   ก. เพื่อหาทางแก้ไขข้อบกพร่องของนักเรียนในการพัฒนาบุคลิกภาพ
      วิธีการเรียน และยกระดับความรู้และทักษะ 5 4 3 2 1 ม
   ข. เพื่อชี้ระดับความสามารถของนักเรียน 5 4 3 2 1 ม
   ค. เพื่อชี้ให้เห็นจุดเด่นและจุดอ่อนของนักเรียน 5 4 3 2 1 ม
   ง. เพื่อชี้ให้เห็นถึงระดับความสามารถในการแก้ปัญหา
      เฉพาะหน้าของนักเรียน 5 4 3 2 1 ม
   จ. เพื่อประโยชน์ในการแนะแนวนักเรียน 5 4 3 2 1 ม

5. โรงเรียนได้จัดให้มีการประเมินผลอย่างต่อเนื่อง เพื่อชี้ให้เห็นว่า
ได้บรรลุจุดมุ่งหมายหลัก, จุดประสงค์ของรายวิชามากน้อยแค่ไหน 5 4 3 2 1 ม

6. โรงเรียนได้ใช้วิธีการประเมินผลอย่างหลากหลาย เพื่อความ
เหมาะสมกับคุณลักษณะของนักเรียน และลักษณะของจุดประสงค์
ในรายวิชานั้น ๆ 5 4 3 2 1 ม

ง. การประเมินผลสัมฤทธิ์ของนักเรียน และโปรแกรมการเรียน (ต่อ)

7. โรงเรียนได้ประเมินผลของหมวดวิชาและตัวนักเรียนโดยได้ใช้
ข้อมูลที่ได้จากการเก็บรวบรวม, วิเคราะห์, และติดตาม
อย่างเหมาะสม 5 4 3 2 1 ม

8. โรงเรียนได้ใช้ผลการประเมินเพื่อตัดสินประสิทธิภาพของครู
และโปรแกรมการเรียนการสอน 5 4 3 2 1 ม

9. โรงเรียนได้ใช้ผลการประเมินของหมวดวิชาอุตสาหกรรมศิลป์
เพื่อปรับปรุงและเปลี่ยนแปลงแก้ไข โปรแกรมการเรียนการ
สอนในหมวดวิชานี้ 5 4 3 2 1 ม

การประเมินผลนักเรียน และโปรแกรมการเรียน

1. โครงการประเมินผลของโรงเรียนได้คำนึงถึงความแตกต่าง
ระหว่างบุคคลของนักเรียน อย่างเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

2. โรงเรียนได้นำผลที่ได้รับจากการประเมินตัวนักเรียน มาใช้
ในเรื่องต่อไปนี้อย่างมีประสิทธิภาพเพียงใด
    ก. เพื่อหาทางแก้ไขข้อบกพร่องของนักเรียนในการพัฒนา
    บุคลิกภาพ, วิธีการเรียน และเพื่อยกระดับความรู้
    และทักษะของนักเรียน 5 4 3 2 1 ม
    ข. เพื่อวัดจุดเด่นและจุดอ่อนของนักเรียน 5 4 3 2 1 ม
    ค. เพื่อวัดผลสัมฤทธิ์ของนักเรียน 5 4 3 2 1 ม
    ง. เพื่อวัดความสามารถของนักเรียนในการนำความรู้
    ไปแก้ปัญหาเฉพาะหน้า 5 4 3 2 1 ม
    จ. เพื่อการแนะแนวนักเรียน 5 4 3 2 1 ม

3. โรงเรียนได้รายงานผลการประเมินให้ครู, นักเรียน, และ
ผู้ปกครองทราบเป็นการเพียงพอ หรือไม่ 5 4 3 2 1 ม

4. วิธีการประเมินผลที่โรงเรียนใช้อย่างหลากหลายในการประเมิน
ผลโปรแกรมการเรียน มีประสิทธิภาพ แค่ไหนเพียงใด 5 4 3 2 1 ม

5. โรงเรียนได้เก็บข้อมูล, วิเคราะห์, และตีความได้อย่างเหมาะสม
หรือไม่ เพียงใด 5 4 3 2 1 ม

6. โรงเรียนได้ใช้ผลการประเมินเพื่อวัดประสิทธิภาพของการสอนได้
อย่างมีประสิทธิภาพ แค่ไหนเพียงใด 5 4 3 2 1 ม

7. โรงเรียนได้ใช้ผลประโยชน์เพื่อแก้ไข, เปลี่ยนแปลง, และปรับปรุง
โครงการเรียนการสอนได้อย่างมีประสิทธิภาพ มากน้อยเพียงใด 5 4 3 2 1 ม

การประเมินผลนักเรียน และโปรแกรมการเรียน (ต่อ)

8. โรงเรียนได้ใช้ผลการประเมินเพื่อชี้วัดผลสัมฤทธิ์ของโปรแกรมการเรียนการสอนโดยส่วนรวมในหมวดวิชาอุตสาหกรรมศิลป์ ได้อย่างเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

ข้อเสนอแนะ

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V เครื่องมือ และอุปกรณ์

โรงฝึกงาน

1. ~~ห้องเรียน~~โรงฝึกงานตั้งอยู่ในตำแหน่งที่สะดวกต่อการใช้และอยู่ไม่ไกลไป
จากห้องเรียนอื่น ๆ ที่เกี่ยวข้องกัน 5 4 3 2 1 ม

2. ~~ห้องเรียน~~โรงฝึกงานมีขนาดพอเหมาะที่จะจัดกิจกรรมการเรียนการสอน
ต่าง ๆ ได้อย่างพอเพียง 5 4 3 2 1 ม

3. พื้นห้องของโรงฝึกงาน มีคุณลักษณะไว้มาตรฐานของโรงฝึกงาน
ทั่วไป 5 4 3 2 1 ม

4. มีห้องสะอาดอย่างพอเพียงสำหรับนักเรียนทั้งชายและหญิง ตั้งอยู่
บริเวณใกล้โรงฝึกงาน 5 4 3 2 1 ม

5. ครูแต่ละคนในหมวดวิชาอุตสาหกรรมศิลป์ มีห้องนักครูมีขนาด
กว้างขวาง พอที่จะทำงานได้อย่างสะดวก 5 4 3 2 1 ม

6. โรงฝึกงานมีเนื้อที่สำหรับการสาธิต และการบรรยายอย่าง
พอเพียง 5 4 3 2 1 ม

7. โรงฝึกงานแต่ละหลัง มีความสูงของเพดานที่มีขนาดเหมาะสม
กับลักษณะของกิจกรรมการเรียนการสอนในโรงฝึกงานนั้น ๆ 5 4 3 2 1 ม

8. ภายในโรงฝึกงาน ได้มีการควบคุมความร้อน แสง และการ
ระบายอากาศ การสะท้อนของเสียง ไว้อย่างพอเพียง 5 4 3 2 1 ม

V เครื่องมือ และอุปกรณ์ (ต่อ)

9. ในโรงฝึกงานได้มีการติดตั้งอุปกรณ์สำหรับดูดอากาศเสียและฝุ่นละอองอย่างเพียงพอ 5 4 3 2 1 ม

10. ภายในบริเวณโรงฝึกงาน ได้จัดให้มีสาธารณูปโภคอย่างพอเพียง 5 4 3 2 1 ม

11. สภาพทั่วไปของโรงฝึกงานได้มาตรฐานตามกฎของความปลอดภัย 5 4 3 2 1 ม

12. ภายในโรงฝึกงานได้มีการตีเส้นแบ่งเขตเป็นบริเวณที่ปฏิบัติงาน ทางเดิน เพื่อความปลอดภัยของผู้ใช้ 5 4 3 2 1 ม

13. พื้นโรงฝึกงานไม่ลื่น ปราศจากสิ่งกีดขวาง และเศษวัสดุต่าง ๆ 5 4 3 2 1 ม

14. บริเวณที่ปฏิบัติงานรอบ ๆ เครื่องจักร มีพื้นผิวขรุขระเพื่อกันไม่ให้ลื่น เป็นการสร้างความปลอดภัยแก่ผู้ใช้เครื่องจักร 5 4 3 2 1 ม

15. ในโรงฝึกงานแต่ละหลังที่มีการติดตั้งเครื่องจักรกล มีปุ่มตัดไฟฟ้าฉุกเฉินอย่างน้อย 1 ที่ ต่อโรงฝึกงาน 1 หลัง 5 4 3 2 1 ม

16. ในโรงฝึกงานมีการติดตั้งเครื่องดับเพลิงมาตรฐาน ไว้ในตำแหน่งที่เหมาะสม สะดวกต่อการใช้ และได้รับการตรวจตราอย่างสม่ำเสมอ 5 4 3 2 1 ม

17. ในโรงฝึกงาน ได้ติดตั้งตู้ยาและของใช้สำหรับเหตุฉุกเฉินไว้เป็นประจำ 5 4 3 2 1 ม

18. ในโรงฝึกงานได้มีการใช้สีต่าง ๆ เพื่อสร้างความปลอดภัยแก่ผู้ปฏิบัติงานภายในโรงฝึกงานอย่างพอเพียง 5 4 3 2 1 ม

V เครื่องมือ และอุปกรณ์ (ต่อ)

19. ในโรงฝึกงานแต่ละหลัง มีที่ตัดไฟใหญ่ (MASTER SWITCH)
ซึ่งสามารถปิดไว้ได้อย่างมิดชิด เมื่อไม่ได้ใช้งาน 5 4 3 2 1 ม

20. บริเวณที่ปฏิบัติงาน มีเนื้อที่อย่างพอเพียง สำหรับเก็บวัสดุฝึกและ
อุปกรณ์ต่าง ๆ 5 4 3 2 1 ม

21. โรงเรียน ได้จัดให้มีห้องเก็บของอย่างพอเพียงที่จะให้นักเรียน
เป็นรายคน หรือเป็นกลุ่มได้เก็บชิ้นงานที่ยังทำไม่แล้วเสร็จหรือ
ใช้เก็บชิ้นงานที่อยู่ในขั้นตอนของการประกอบและการตกแต่ง 5 4 3 2 1 ม

22. โรงเรียนได้จัดให้มีตู้โชว์ หรือที่แสดงผลงานของนักเรียนอย่าง
พอเพียง โดยมีขนาดและตั้งอยู่ในที่เหมาะสม 5 4 3 2 1 ม

23. โรงเรียนได้จัดให้มีตู้เก็บของส่วนตัวนักเรียน เพียงพอกับจำนวน
นักเรียนในโปรแกรมการเรียนวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

24. โรงฝึกงานมีห้องเก็บวัสดุติดไฟง่าย เพื่อความปลอดภัยของผู้ใช้
โรงฝึกงาน 5 4 3 2 1 ม

เครื่องมือ อุปกรณ์ และวัสดุ

1. โรงเรียนได้จัดหาวัสดุฝึก และอุปกรณ์สำหรับใช้ประกอบการเรียนการสอน อย่างเพียงพอ 5 4 3 2 1 ม

2. โรงเรียนได้จัดหาโสตทัศนอุปกรณ์ไว้ใช้ในการเรียนการสอนอย่างเพียงพอ 5 4 3 2 1 ม

3. โรงเรียนได้จัดให้มีป้ายนิเทศและกระดานดำเป็นจำนวนเพียงพอกับการใช้งาน 5 4 3 2 1 ม

4. โรงเรียนได้จัดหาเครื่องมืออุปกรณ์ และวัสดุฝึกสำหรับประกอบการเรียนการสอนไว้อย่างหลากหลาย 5 4 3 2 1 ม

5. เครื่องมือ อุปกรณ์ ที่ใช้ในโรงฝึกงาน ต่างก็ได้รับการดูแลบำรุงรักษาอย่างดี ตรงตามมาตรฐานของกฎแห่งความปลอดภัย 5 4 3 2 1 ม

6. เครื่องจักร และเครื่องมือกลทุกเครื่อง ได้มีการติดตั้งที่ป้องกันอันตรายอยู่เสมอเป็นประจำ ยกเว้นในกรณีที่เครื่องจักรกำลังถูกปรับซ่อม หรือกำลังถูกทำความสะอาด 5 4 3 2 1 ม

7. เครื่องจักรและเครื่องมือกลทุกเครื่องที่มีในโรงงาน มีที่ป้องกันอันตรายที่เหมาะสม ตรงตามมาตรฐานทุกเครื่อง 5 4 3 2 1 ม

8. เครื่องจักร เครื่องมือ อุปกรณ์ หรือเครื่องใช้ใด ๆ ที่ได้ถูกตรวจพบว่า อยู่ในสภาพที่ไม่ปลอดภัยต่อการใช้งาน จะต้องถูกห้ามใช้งานทันที พร้อมทั้งเครื่องหมายห้ามใช้ติดไว้อย่างชัดเจน 5 4 3 2 1 ม

เครื่องมือ อุปกรณ์ และวัสดุ (ต่อ)

9. สวิทช์แม่เหล็กควบคุมการทำงานของเครื่องจักร, กล่องสวิทช์ควบคุมการทำงานของเครื่องจักร และอุปกรณ์ห้ามล้อ สำหรับเครื่องจักรบางเครื่อง ได้ถูกติดตั้งไว้ในตำแหน่งที่เหมาะสมสะดวกต่อการใช้งาน 5 4 3 2 1 ม

10. โรงเรียนได้จัดหาอุปกรณ์ป้องกันสายตา สำหรับนักเรียนที่ต้องปฏิบัติงาน ในสภาวะที่อาจก่อให้เกิดอันตรายต่อสายตา 5 4 3 2 1 ม

11. นักเรียนมีอุปกรณ์ป้องกันหู เมื่อต้องปฏิบัติงานหรือต้องสัมผัสกับสภานที่อาจก่อให้เกิดอันตรายแก่หูได้ 5 4 3 2 1 ม

12. ในโรงฝึกงานมีอุปกรณ์ป้องกันระบบการหายใจ สำหรับผู้ที่ต้องปฏิบัติงานในสภาวะที่อาจก่อให้เกิดปัญหาต่อระบบหายใจได้ 5 4 3 2 1 ม

13. ในโรงฝึกงาน มีอุปกรณ์ป้องกันศีรษะ สำหรับผู้ที่ต้องปฏิบัติงานในสถานที่ซึ่งอาจก่อให้เกิดอันตรายต่อศีรษะได้ 5 4 3 2 1 ม

14. ทั้งครูและนักเรียนต่างก็สวมชุดปฏิบัติงานให้เหมาะสมกับสภานของสถานที่ปฏิบัติงาน 5 4 3 2 1 ม

15. บรรดาอุปกรณ์สำหรับป้องกันอันตรายต่าง ๆ ที่ถูกใช้เป็นส่วนตัว (แว่นตา, หน้ากาก) ได้รับการทำความสะอาดทุกครั้ง หลังการใช้งาน 5 4 3 2 1 ม

16. ได้มีการปรับซ่อม บำรุงรักษา เพื่อเป็นการป้องกันอันตรายและเพื่อเป็นการแก้ไขข้อบกพร่องของอุปกรณ์ และเครื่องมือต่าง ๆ อยู่เป็นประจำเสมอ 5 4 3 2 1 ม

เครื่องมือ อุปกรณ์ และวัสดุ (ต่อ)

17. ครุภัณฑ์มีความเหมาะสมสำหรับการเรียนการสอนในหมวดวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

18. เครื่องจักร และเครื่องมือได้ถูกติดตั้งไว้ในตำแหน่งที่จะใช้งานได้อย่างสะดวก และปลอดภัยต่อผู้ใช้ 5 4 3 2 1 ม

การประเมินผล เครื่องมือ อุปกรณ์ และวัสดุ

1. เครื่องมือ วัสดุ และอุปกรณ์ในโรงฝึกงาน มีส่วนสนับสนุนให้การเรียนการสอนบรรลุเป้าหมาย ของหมวดวิชาอุตสาหกรรมศิลป์ แค่ไหน เพียงใด 5 4 3 2 1 ม

2. โรงฝึกงานมีเนื้อที่สำหรับจัดกิจกรรมการเรียนการสอนเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

3. โรงฝึกงานมีเครื่องมือ วัสดุ อุปกรณ์ สำหรับการเรียนการสอนเพียงพอหรือไม่ เพียงใด 5 4 3 2 1 ม

4. โรงเรียนได้ใช้เครื่องมือ วัสดุ อุปกรณ์ สำหรับกิจกรรมการเรียนการสอน อย่างมีประสิทธิภาพเพียงใด 5 4 3 2 1 ม

5. โรงฝึกงานมีห้องเก็บวัสดุ อุปกรณ์ และเครื่องใช้ต่าง ๆ อย่างพอเพียงกับการใช้งานหรือไม่ เพียงใด 5 4 3 2 1 ม

6. เครื่องมือ อุปกรณ์ ได้รับการบำรุงรักษาให้อยู่ในสภาพที่ใช้งานได้อย่างมีประสิทธิภาพ หรือไม่เพียงใด 5 4 3 2 1 ม

7. สภาพของโรงฝึกงานโดยทั่วไป ได้รับการดูแลรักษาเพื่อให้อยู่ในสภาพสะอาดเรียบร้อย แค่ไหน เพียงใด 5 4 3 2 1 ม

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VI บรรยากาศของการเรียนการสอน

1. โรงเรียนได้ยึดถือเป้าหมาย จุดประสงค์ของหมวดวิชาอุตสาหกรรมศิลป์
   เพื่อเป็นแนวทางในการจัดการเรียนการสอนในหมวดวิชานี้ 5 4 3 2 1 ม

2. คณะครูผู้สอนต่างทำงานอย่างมีประสิทธิภาพ และได้อุทิศเวลาให้
   กับโรงเรียน 5 4 3 2 1 ม

3. ฝ่ายบริการให้การสนับสนุนด้านงบประมาณ และให้กำลังใจแก่
   บุคลากรในหมวดวิชานี้ 5 4 3 2 1 ม

4. ทั้งฝ่ายบริหารและคณะครูผู้สอนต่างมีความมุ่งหวังอย่างสูงใน
   ความสำเร็จของนักเรียน 5 4 3 2 1 ม

5. ผู้ปกครองและชุมชนได้ให้การสนับสนุนการเรียนการสอน
   ในหมวดวิชาอุตสาหกรรมศิลป์ 5 4 3 2 1 ม

6. โปรแกรมการเรียนการสอนสนองความแตกต่าง ของนักเรียน
   แต่ละคนในด้านการพัฒนาบุคลิกภาพ, วิธีการเรียนรู้,
   ความรู้ความสามารถ, และระดับทักษะ 5 4 3 2 1 ม

7. โรงเรียนได้จัดให้นักเรียนได้เรียนในโปรแกรมการเรียน
   ตามแผนการณ์ในอนาคตของนักเรียน และตามความสามารถ
   ของนักเรียนแต่ละคน 5 4 3 2 1 ม

8. โรงเรียนได้จัดตารางการใช้โรงฝึกงานเพื่อให้สามารถใช้
   โรงฝึกงานได้จำนวนชั่วโมงสูงสุด 5 4 3 2 1 ม

9. ครูผู้สอนได้ใช้วิธีสอนและเทคนิคต่าง ๆ เพื่อส่งเสริมให้
   นักเรียนได้แสดงออกเป็นรายบุคคล 5 4 3 2 1 ม

VI บรรยากาศของการเรียนการสอน (ต่อ)

10. นักเรียนทุกคนต่างก็มีโอกาสและได้รับการสนับสนุนให้บรรลุ
จุดประสงค์ของทั้งโปรแกรมการเรียน และของตัวนักเรียน
แต่ละคน 5 4 3 2 1 ม

11. นักเรียนทุกคนต่างได้รับทราบผลการเรียนของตนเป็นประจำ
อยู่เสมอๆ 5 4 3 2 1 ม

12. ผลการประเมินการสอนของครูได้นำไปใช้เพื่อการปรับปรุง
การเรียนการสอน 5 4 3 2 1 ม

13. นักเรียนทุกคนต่างมีความสัมพันธ์ที่ดีทั้งต่อเพื่อนนักเรียนด้วยกัน
และต่อครูด้วย นอกจากนั้นนักเรียนทุกคนได้รับการปฏิบัติอย่าง
ให้เกียรติจากเพื่อนนักเรียนและจากครูอันจะเป็นการส่งเสริม
ให้นักเรียนมีความรู้สึกนับถือตนเอง 5 4 3 2 1 ม

14. ระเบียบวินัยและกฎข้อบังคับต่าง ๆ ของโรงเรียนและห้อง
เรียนส่งเสริมบรรยากาศการเรียนรู้ในทางบวก 5 4 3 2 1 ม

15. ทั้งนักเรียนและครูต่างก็ได้รับการยอมรับ และยกย่องเมื่อได้
บรรลุเป้าหมายของการเรียนการสอน ในหมวดวิชาอุตสาหกรรม
ศิลป์ 5 4 3 2 1 ม

16. วัสดุ อุปกรณ์ และเครื่องมือ เครื่องใช้ในโรงฝึกงาน ดูแล้ว
สวยงามใช้งานได้อย่างดี ปลอดภัยและได้รับการบำรุงรักษา
อย่างดี 5 4 3 2 1 ม

การประเมินผลบรรยากาศของการเรียนการสอน

1. บรรยากาศการเรียนการสอน ในหมวดวิชาอุตสาหกรรมมีส่วนส่งเสริมให้บรรลุเป้าหมาย. จุดประสงค์ของหมวดวิชาแค่ไหน เพียงใด	5	4	3	2	1	ม
2. บรรยากาศการเรียนการสอนในหมวดวิชาอุตสาหกรรมศิลป์ ก่อให้เกิดความมั่นคงใจและความนับถือตนเองในตัวนักเรียน มากน้อยแค่ไหน	5	4	3	2	1	ม
3. บรรยากาศการเรียนการสอนในหมวดวิชาอุตสาหกรรมศิลป์ ก่อให้เกิดความสำเร็จแก่ตัวนักเรียนแต่ละคนมากน้อยเพียงใด	5	4	3	2	1	ม
4. โปรแกรมการเรียนการสอนวิชาอุตสาหกรรมศิลป์ ได้มีการประเมินเนื้อหาวิชาและความต้องการของนักเรียนพร้อมทั้งได้ทบทวนให้เหมาะสมอยู่เสมอหรือไม่ เพียงใด	5	4	3	2	1	ม
5. กลุ่มบุคคลต่อไปนี้ มีความคิดเห็นเกี่ยวกับบรรยากาศการเรียนการสอนในหมวดวิชาอุตสาหกรรมศิลป์ ในทางบวก (ในทางที่ดี) มากน้อยแค่ไหน						
ก. นักเรียน	5	4	3	2	1	ม
ข. ครู	5	4	3	2	1	ม
ค. ผู้ปกครองและชุมชน	5	4	3	2	1	ม
ง. ฝ่ายบริหารโรงเรียน	5	4	3	2	1	ม
จ. ฝ่ายบริหารท้องถิ่น	5	4	3	2	1	ม
ฉ. กระทรวงศึกษาธิการ	5	4	3	2	1	ม

ข้อเสนอแนะ

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VII สรุปการประเมินผลและข้อเสนอแนะ

ก. จุดเด่นของโปรแกรมการเรียนการสอน

โปรดบรรยายถึงลักษณะเด่นของการจัดการเรียนการสอนวิชาอุตสาหกรรมศิลป์ ที่ท่านมีความพึงพอใจมากที่สุด

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ข. จุดอ่อนหรือข้อจำกัดของโปรแกรมการเรียนการสอน

โปรดบรรยายถึงสิ่งที่ต้องได้รับการปรับปรุงแก้ไขให้ดีขึ้น ในการจัดการเรียนการสอน ในหมวดวิชาอุตสาหกรรมศิลป์

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ค. ข้อเสนอแนะ

โปรดเสนอวิธีแก้ไขสิ่งที่ควรได้รับการปรับปรุงแก้ไข ในการจัดการเรียนการสอน ตามที่ท่านได้ระบุไว้ในหัวข้อ "จุดอ่อน หรือ ข้อจำกัดของโปรแกรมการเรียนการสอน" โดยระบุตามลำดับความสำคัญก่อนหลัง

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